

**iasa**

**International Association of Sound and Audiovisual Archives**

**Association Internationale d'Archives Sonores et Audiovisuelles**

**Internationale Vereinigung der Schall- und Audiovisuellen Archive**

# **iasa journal**

(formerly Phonographic Bulletin)

**no. 7 May 1996**

## IASA JOURNAL

---

Journal of the International Association of Sound Archives IASA  
Organe de l'Association Internationale d'Archives Sonores IASA  
Zeitschrift der Internationalen Vereinigung der Schallarchive IASA

Editor: Helen P Harrison, Open University Library, Walton Hall, Milton Keynes, MK7 6AA, England.

Fax: +44 908 653744

Reviews and Recent Publications Editor: Pekka Gronow, Finnish Broadcasting Company, PO Box 10, SF-00241, Helsinki, Finland. Fax: 3580 1480 2089

The IASA Journal is published twice a year and is sent to all members of IASA. Applications for membership in IASA should be sent to the Secretary General (see list of officers below). The annual dues are 25GBP for individual members and 100GBP for institutional members. Back copies of the IASA Journal from 1971 are available on application. Subscriptions to the current year's issues of the IASA Journal are also available to non-members at a cost of 35GBP.

Le Journal de l'Association internationale d'archives sonores, le IASA Journal, est publié deux fois l'an et distribué à tous les membres. Veuillez envoyer vos demandes d'adhésion au secrétaire dont vous trouverez l'adresse ci-dessous. Les cotisations annuelles sont en ce moment de 25GBP pour les membres individuels et 100GBP pour les membres institutionnelles. Les numéros précédentes (à partir de 1971) du IASA Journal sont disponibles sur demande. Ceux qui ne sont pas membres de l'Association peuvent obtenir un abonnement du IASA JOURNAL pour l'année courante au coût de 35GBP.

Das IASA JOURNAL erscheint zweimal jährlich und geht allen Mitgliedern der IASA zu. Aufnahmeanträge für die Mitgliedschaft bei der IASA sind an das Sekretariat (Anschrift siehe unten) zu richten. Die Mitgliedsbeiträge betragen derzeit 25GBP für individuelle Mitglieder und 100GBP für Institutionen. Frühere IASA JOURNAL (ab 1971) sind auf Anfrage erhältlich. Der Bezugspreis des IASA Journal für Nicht-Mitglieder beträgt 35GBP.

### THE EXECUTIVE BOARD OF THE INTERNATIONAL ASSOCIATION OF SOUND ARCHIVES IASA

President: James McCarthy, National Film and Sound Archive, Sydney Regional Office, 84 Alexander St., Crows Nest 2065, Australia. Fax +61 2 436 4178

Vice Presidents: Magdalena Cséve, Hungarian Radio, Documentation, Bródy Sandor u. 5-7, H-1800 Budapest, Hungary. Fax (36-1) 138 8310

Giorgio Adamo, Discoteca di Stato, Via Caetani 32, I-00186 Rome, Italy Fax 396 686 5837

Kurt Deggeller, Fonoteca Nazionale Svizzera, Via Foce 1, CH-9606, Lugano, Switzerland. Fax +41 91 972 6169

Past President: Gerald D Gibson, Research and Testing Office, Preservation Office, Library of Congress, Washington DC 20540-4800, USA. Fax: 1 (202) 707 6449

Editor: Helen P Harrison, Open University Library, Walton Hall, Milton Keynes MK7 6AA, England. Fax +44 1908 653744 or +44 1908 653571

Secretary General: Sven Allerstrand, ALB, Box 24124, S-104 51 Stockholm, Sweden. Fax +46 8 663 1811

Treasurer: Mark Jones, 46, Chepstow Road, London W2 5BE, England. Fax: +44 181 444 2023

© The International Association of Sound Archives IASA

Printed in Budapest, Hungary

No part of this issue may be reproduced in any form, by print, photoprint, microfilm or any other means without written permission from the publisher. Signed articles and reviews represent the opinions of the authors and do not necessarily reflect the policies of the Association.

ISSN 1021-562X

## EDITORIAL

*Helen P Harrison*

This is my swansong as Editor of the Journal, a time for short reminiscence but also a time to look ahead for IASA. During the Perugia conference one of the sessions will look forward and I start with this, but the forward years grow out of the past and present and I crave your indulgence for a short visit to that past. It made IASA what it is today, for better or worse.

I came to IASA in 1978 in Lisbon - why? *As if anyone cares*, but I was in a University Library in UK which was breaking new ground in distance learning using film, tv and video, radio/audio, photographs/slides and all the av accoutrements. We were also making an av archive 'from scratch' or perhaps it should be said to be an "archive" in inverted commas. At the same time we were part of the Open University providing reference material and information in all formats to the academic community which produced our courses. They were exciting times - but I was able as Media Librarian/Archivist to join some of the International Associations for media archives. I joined the AV Library groups and IASA. They were hospitable even to hybrid mavericks - these curious beings called Audiovisual Archivists. I believe this to be one of the strengths of IASA - it lets you in as an archivist but does not restrict your interests, indeed it encourages you to widen your scope.

During the years with IASA there were moments when I wondered what we were trying to do and where we were going, but I personally owe IASA a great debt. It nourished and expanded an interest and concern in the craft of av archivism and it widened my horizons. Never one to stay at home I have travelled the world with IASA and on IASA business.

From 1979 personal involvement became serious - oh yes even I can be serious! The Cambridge conference loomed and I suddenly found myself assisting in the organisation of the first of many conferences. Once you have done one you know the problems and risks, but you also know the satisfaction of producing an opportunity for like minded individuals to meet, exchange information and experience and enjoy a week a year just talking to each other.

Looking towards a quiet? retirement I also reflect on the many friends met and made during the IASA years - *no dancing years* please! I was elected to the Executive Board in 1981 and have served in some capacity ever since. It really is time to go - but I have been privileged to work with some of the major figures in the world of sound archives. Some were on the Board, others not. I remember with appreciation working with Rolf Schuurmsma, Dietrich Schüller, Dietrich Lotichius, David Lance, Ulf Scharlau, and meeting some of the founding fathers of the Association, Tim Eckersley, Don Leavitt and Harold Heckmann. There have been other members around the world too numerous to mention, and all because I joined IASA - it is not all work! IASA is a friendly Association and long may it remain so - we do not bitch at each other all the time, or we did not. You will never convince me that management principles and practices can take the place of trust and good friendship - this does not mean a lowering of standards of excellence but should improve morale and working relationships. Am I old fashioned? - how did you guess!

But enough of the personal. During the years I have been a member IASA has grown

in influence and importance due to its members and the work of successive Boards and Committees. It is almost time to write a history of IASA, but there is too much to do and energies have to be put into making progress, rather than reflecting on past glories. But let us do just that for a few words.

Rolf Schuurmsma wrote a very human account of the beginnings of the Association in 1969, published in *IASA Journal* no. 3 May 1994. Taking it up from there in the early 1980s we were growing in confidence, publishing reference materials - yes publishing - consolidating our commitments to UNESCO. IASA contributed several papers to the RAMP programme of UNESCO in the 1980s and became a founding member of the Round Table on Audiovisual Records. In order to gain a bigger say within UNESCO we had applied for a consultative status as early as 1977, and in 1989 we achieved this objective. Since then we have been able to contribute more fully to the UNESCO programmes with publications and surveys and received several commissions/contracts from UNESCO. IASA also contributes to the General conference, the PGI Council and the Memory of the World project in no small measure. We have produced bibliographies, glossaries and contributed towards world surveys of AV archives, legal issues affecting AV archives and training programmes. Considering that this is an Association made up of voluntary members, prepared to give time and energy to the production of these materials it has been some achievement.

In 1987 we started a dialogue among members to extend the interests of IASA in an innocent attempt to assist recruitment and more important provide an acceptable association for the newly developing audiovisual archives. It has been a long, hard and unnecessarily winding road. Finally in 1995 the membership decided to embrace the idea. It does not make IASA any different, just more effective and even friendlier towards archivists.

Now we are into this new phase there are many important issues which have to be faced, worked through and in which IASA has a real role to play. These issues can be have been identified as selection, legal, cataloguing, training, technical and even collections management - that awful word again.

IASA should be directing its energies towards these issues - we need to be involved in the legal issues debate, to obtain something positive and of value for our sound archives to work with - we need certain rights as sound archives to acquire, copy, restore and preserve the materials we acquire. We also need suitable agreements, whether mandatory or not, with our donors to maintain the integrity of these materials and need to be able to exhibit or give access to the general public whose heritage it is. The rights of archives must be as clearly defined and protected as the rights of producers.

We also need to develop suitable documentation techniques, including cataloguing groundrules in order to provide and exchange information in acceptable forms without the confusion of everyone going their own sweet way and choosing their own set of terms, not always known by the person trying to retrieve the information. We need to develop selection guidelines, not just for ourselves, but for the world outside who look to us for guidance. We need selection policies and principles to decide what each of us should keep and protect. Resources are scarce as we are all aware, and duplication of materials in several archives. although sometimes a convenient safety measure, may be an unaffordable luxury.

We need technical guidelines for preservation and restoration as well as the selection and preservation of archival quality materials/carriers and - to come down to earth - just how to keep these materials for a little longer than nature says we can in order to copy and preserve the content.

The literature of av archivism needs to be extended. In compiling a bibliographic database over a number of years I have only amassed 1750 entries. Although by far the largest proportion of these deal with sound archiving, I would like to see IASA publishing much more in the way of standards, guidelines for good practice, glossaries, bibliographies, minimum data lists and requirements for several functions and also the development of a home page on the World Wide Web. These need not all be lengthy documents, in fact succinct practical documents would probably reach a wider audience.

IASA needs to be representing the membership in many international fora relevant to its sphere of interest, most especially in UNESCO. This will bring benefits to the membership as a whole, by influencing developments in archival policies, legislation, technical practice and research and by raising the awareness of the significance of sound and audiovisual archives in safeguarding the cultural heritage. IASA has a lot to contribute and in doing so will be able to bring benefit to its own membership - this of course remains the primary function of the Association - IASA is its members and their needs and views should come first. Who of our members when faced with a particular issue of policy would not like to be able to refer to established and accepted principles and practice, both to assist their own thinking and to be able to cite these to their own governing bodies or government.

There is so much still to do and IASA has to be playing its part in this research and practice. It can and it has to.

Before I go I want to ride one more hobby-horse - with editorial licence. The archive world once appeared to be a quiet backwater where decisions could be made thoughtfully, slowly and in peace. This world was first turned around in the past few decades by the speed of development of the av world with its constantly changing systems and formats. It was then shaken by the exponential speed of developments in electronic systems of storage and transmission of documents. I do not like the way av is being confused with multimedia. To me multimedia is a tool fed by the audiovisual materials. There are no multimedia archives and what the outside world calls multimedia is only electronic documents - surrogate av materials sometimes, mere alternatives to print in most instances. To identify av for what it really is - not just a component of e-documents is a cause worth pursuing, and I hope that IASA will recognise this. Without a clear distinction we will find our lives complicated by substitutions. We must go back to the original and remember - there is only *one* master sound recording, *one* original film and *one* original video. These supply the e-documents and multimedia. Electronic documents are copies taken from so many sources they may be difficult to trace. They have little in common with the issues of archiving of audiovisual materials - only as convenient storage materials and these are still somewhat suspect.

To come to the present issue of the Journal. It is shorter than usual, but feel the quality! One or two papers are left from last year's conference in Washington, including Steven Smolian's very readable account of the work of the APE (Audio Preservation Expert) - a new acronym to add to the list. I deliberately included both

Steven's paper given at the conference as the practice of the new personality and material from his brochure on the techniques or procedure of the animal. Also included are Bill Storm's piece on the value of integrated access and Michael Gray on Stereo presentation - once again it would be good to be able to present these on audio-recordings, for people to hear what went on at conference, but that is a thought for my successor. Dietrich Schüller has contributed a pragmatic article on the preservation of material in hot and humid climates. Two recent UNESCO surveys which IASA has been involved with are presented: the Survey on Endangered Carriers carried out by IASA as part of the Memory of the World programme and that of Catherine Pinion for IFLA on deposit and AV Archives, something with which IASA has been closely involved.

It has been a privilege to serve as Editor, and if I have appeared to nag people and pursue material relentlessly at times, that is part of an Editor's job and I hope that the results have been acceptable. I wish my successor the very best and urge you, the members, to continue to assist us in the provision of information and in-depth articles which fellow members of the Association will be interested in and which will advance the knowledge and influence of IASA.

I also look forward to seeing many members in Perugia for what promises to be a feast. This *was* my swansong, but I hope not a dying aria like Dido, or Delibes' dying swan, rather the Queen of Sheba, trumpets and all. I did not say that - one of my colleagues from the Round Table came up with it - you see what friends you get from being a member of IASA!

The *IASA JOURNAL* is constantly looking for material to publish: articles, reviews, reports of meetings or new developments. Please send anything which you may consider of interest to fellow members to the Editor, address on the front inside cover. Please send copy in either good letter quality or better on PC floppy disc in ASCII format.

The date for copy of the next issue, Number 8 to be published in November 1996 is

**30 September 1996**

## PRESIDENTS LETTER

*James McCarthy*

One subject which can induce feelings of fatigue in IASA members and especially the Board, is 'The future of IASA.' This comes up so often that many members believe we should stop being so self absorbed and just get on with the job. It is my observation, after nearly three years as IASA President, that this *is* part of 'getting on with the job. If we lived in a static world, where change was minimal, I would probably agree with the critics, but we do not and must be continually ready for change and ready to adjust the mechanisms which enable us to proceed.

Our recent move to embrace AV documents and archives was part of this. So is our reaching out to other associations as partners for our meetings. We must be able to readily adjust our structure in order to fulfil members needs and meet our responsibilities upon a wider field; such as our regular and productive responses to UNESCO; as seen most recently in the *Survey of Endangered Audio Carriers* and the *AV Reader*. This is part of the future of IASA, a debate which is not simply confined to endless agonising about our status in the world, or whether we should even exist at all.

The reaching out continues. We hope, for instance, to hold our 1998 conference in Oman. This will give our constituency a wider view of our world, and also enable local workers in audio-visual disciplines to have better access to our organisation and the work we do. There is also the possibility of meeting with the new South East Asian group, SEAPAVAA, in the next few years. They held their inaugural (and very successful) meeting in Manila recently. The creation of this regional group would enable us to meet in a way not possible before this.

Similarly, we have just met with our colleagues on the Round Table of Audiovisual Archive Associations. Here we are also discussing the future of the Round Table, driven by similar imperatives. Members are aware it is Euro-centric, as IASA is, and they are seeking ways of making the association more internationally based. I would imagine any future of the Round Table will see an opening up of the membership to include other associations from different parts of the world. We must always be on the look-out for those rare and dedicated people who make all the difference to an association like IASA, and who advance the causes of the Association and the work of audio and audiovisual archives.

In my experience the danger in chasing phantoms can never be too strongly stressed. Most of us have been involved in 'feel good' exercises, which end in failure. Situations where you set up a conference or local branch hoping this will attract new members and spread the influence of the association. It rarely works. We can only go where the energy is. One of the reasons IASA is Euro-centric is that much of the energy and drive within it has come from there. I am also aware that a small country like Australia has made a significant contribution to the association, simply because of the particular focus of energy, primarily audio oriented, which developed locally. Finding those sources of energy in other countries is part of the work of an international association, only this will build a secure association, properly representative of AV archives around the world.

So when I talk about the future of IASA I mean not only the projects and the associations, but the people who who make it work. *They* are the future, and need the support of individual members and individual members alike. *'By their deeds shall we know them'*.

## SOUND RECORDING

### STEREO IN THE 1950'S AND 1960'S: THE COMMERCIALIZATION OF A NEW MEDIUM OF SOUND

*Michael Gray, Voice of America*

Paper presented during the IASA/ARSC/FIAT joint conference in Washington DC in September 1995

The commercialization of stereophonic sound some forty years ago introduced a way of recording music whose achievements remain alive for us today. This morning, I intend to spend a short time talking about the men and women who created this sound. Some of their names, and many of the techniques they developed, will be familiar to us. By taking this behind-the-scenes look at the birth and first decade and a half of stereo, however, I hope I can provide a new perspective on a story whose fascination and importance remain fresh to this day.

I have chosen to begin my story of stereo in the year 1954. This choice is not meant as a slight to the work of men like Alan Blumlein, William Snow, Harry Olson, Helmut Kruger, Bert Whyte, or the dozens of other practitioners whose achievements helped make the stereophonic era possible. I have instead chosen the year 1954 as a kind of personal *annus mirabilis* the year in which stereo moved out of the laboratory and into the studio.

I want to start my version of stereo's story by playing four time capsules, three from 1954, and one from the year before. I won't tell you anything about these tapes just now, except to say that each one represents a different stereophonic technique, and that elements of all of them, in one way or another, remain with us today. Make a note to yourselves about what you hear - their identities will be revealed at the end of my talk!

Franck (RCA E4-RP-8170/1) 30 ips "binaural" recording CH 6 April 1954

Weber (Jagerchor from Feischutz) - Teldec Studio, Berlin, 1953 (M/S)

Bach (Motet "Singet dem Herren ein neues Lied) - Teldec Studio April 1954

3 M-49's, A/B/C cardioid backed by 2 M-49's omni behind

Rimsky-Korsakov (Rimsky-Korsakov Antar, Mvt. 2 - Decca M-49 Tree Recorded 17 May 1954)

The key to the stereophonic images that were brought into being in 1954, of course, was how these microphones were deployed and mixed. The models for these choices had, in fact, been well-known since the 1930's. One technique, roughly based on loudness and phase differences caught by two nearly coincident microphones, was the work of Alan Blumlein at EMI's Central Research Laboratories. The other, based on intensity, phase and timing differences created by widely spaced microphones, had

arisen from experiments conducted by William B. Snow at Bell Labs. The making of stereo sound at RCA Victor, and at Decca and EMI in Britain, the companies I have chosen to represent the development of commercial stereo, though we will hear about others as well, rested not just on theory, but on theory mediated and eventually altered by institutional traditions, and by the personal taste of the engineers recording the music.

Now let us take the plunge from the general to the specific. I would like to frame this discussion by identifying what I consider to be three significant "periods", to use that well-worn historical convention, into which the commercialization of stereo rather naturally falls. I will call these periods the "eras" of Experimentation, Elaboration, and Convergence. None of these periods, of course, have hard-and-fast borders. And while the stereotypes that widely spaced microphones were an "American" habit, and coincident pickups a "European" one are, like all stereotypes, true as far as they go, the story is also, as we might expect, a lot more complicated than that,

Let us begin our detailed look with the era of experimentation, that period roughly from 1954 to 1956, when the techniques and equipment developed in the laboratory were applied for the first time to the real-life world of the recording studio. This was, as you might expect, an era in which distinctions between techniques were at their greatest, and the stereotypes they reflect were most clearly defined.

To make the best sense of this period, let us take a look at each of the three companies I identified earlier to see if their recorded incunabula met the criteria of the stereotype. In the case of EMI and RCA Victor, they really do.

Take RCA Victor's now-classic recording of Strauss's *Also sprach Zarathustra* and *Ein Heldenleben*, made in March 1954 in Chicago's Orchestra Hall by engineer Leslie Chase and producer Jack Pfeiffer. These sessions, of course, really should not count as RCA's first. Those had occurred the month before in Boston with Charles Munch and the BSO, though Chase, and also Chicago's lead mono engineer, Lewis Layton, had also participated in an purely experimental "binaural" session with Leopold Stokowski in New York's Manhattan Center the previous October. The session defines classic American A/B stereo technique. It is, however, not pure A/B--take a look in front of the brass section, and you will see a helper mike, an RCA 77-DX, to be exact, that adds just that little bit of extra presence to the sound of the U-47's that Chase has set about 21 feet apart as the main left and right pickups. Incidentally, we can be fairly certain that these 47's are set in cardioid patterns, and not in the more familiar omnidirectional mode that Mercury most notably had made famous in single channel sound, and that would become its own sternly enforced paradigm in three-channel stereo.

For the first two years of RCA stereo, Chase and later Layton himself adhered closely to this style, changing the principal left and right pickups to Neumann M-49's from time to time, and adding on-stage helpers, or sweeteners, as Layton liked to call them, on occasion to fix the "hole in the middle" that was the inevitable, and unfortunate, byproduct of this technique.

No such problem afflicted the EMI system. By November 1953, Philip Vanderlyn of EMI's Central Research Laboratories had concluded that of all the techniques survey in the literature, "the EMI/Blumlein system is as likely to prove as least as cheap as any other system considered." To validate this conclusion, EMI began testing

"binaural" systems in May 1954, testing a variety of separated and coincident microphone system using both EMI's traditional ribbon microphones and Neumann M-49's. By the fall of 1954 after nearly 70 sessions, EMI had at last settled on an experimental system based on a Blumlein pair of Neumann M-49's mounted head-to-head in hum-resistant case, as well as a mixer and a rackful of equipment containing additional shuffler, sum and difference networks, filters and equalizers. On February 7, 1955, engineer Christopher Parker began EMI's first commercial sessions with this system at the Kingsway Hall recording music by Prokofiev. Two months later, EMI held a press conference hosted by the celebrated Sir Malcolm Sargent to introduce their new system, to which they had given the name Stereosonic. By the fall of 1955, EMI became one of the first companies to issue two-track stereo tapes. The sound of these tapes conveyed a technique that would be employed without significant change, save for a new mixer introduced early in 1956, for most of the next three years.

There was, of course, a third way of doing stereo in our *annus mirabilis*. This was the Decca way. Its creator was a man named Roy Wallace, an engineer who has received too little credit for the invention of what we all know today as the Decca Tree. What the Tree consisted of was nothing more than a trio of microphones, two facing left and right were about three feet apart and the third, advanced in front of the other two, facing forward. The Tree, though appearing to be nothing more than A/B mikes shoved together with a third mike to create center fill, reflected a sophisticated understanding that stereo sound needed to have both the bass phase coherence provided by the nearness of the microphones and the solid stereo image provided by their sharply directional orientation. Wallace was the principal investigator for Decca stereo, and throughout its experimental period, he provided its direction and character-building its mixers, at first a six-channel and then a nine-channel model, and experimenting with its microphones, beginning in May 1954 with a "open" trio of directionally patterned M-49's, and then moving to an enclosed, or baffled, trio of M-50's, and to a Tree's with baffled Neumann KM-53's and finally to an open tree consisting of three cardioid patterned KM-56's.

All of techniques produced some wonderful sounding recordings; and perhaps stereo sound in the experimental manner would have been good enough had three factors not helped shove it rather quickly into the era of elaboration. The first factor, of course, was competition: by the end of the year 1956, a host of classical companies, ranging from Capitol, Columbia, Vanguard, and Westminster in the US. to DG and Teldec in Europe had undertaken significant stereophonic recording activity that would soon enlarge the catalog of stereophonic tape recordings that had started to reach the market late in 1955.

The second factor impelling the change was opera recording. It had, of course, been the LP itself that had made recording complete operas musically and financially possible. Both EMI and Decca had in fact recorded a number of operas stereophonically during the experimental era, though only EMI had actually published the results of its sessions on a set of two-track tapes as part of their initial Stereosonic issue. Solving the opera recording problem would require either more mixing channels - or more recording channels, or a combination of both.

For Decca and EMI, at least, the solution was to build mixers with more microphone channels, but continue to record onto two tracks. Bigger mixers were also becoming a routine feature of RCA's technique, (an eight input unit had become the session remote recording standard by early 1956) for most Americans, the solution was not only bigger mixers, but an extra recording channel too. Here the equipment was the

famous Ampex model 300-3, a machine that Mercury had already adopted for stereophonic recording in the spring of 1955, and one that within three years would for most, though not all American companies, become the standard classical recording unit.

The third factor driving the elaboration of stereo technique, of course, was the stereo LP record. Even as recording session technique was moving into more elaborate style, other industry technical leaders were working out the details for two-channel sound on a single-grooved record. By the fall of 1957, industry representatives had at last settled on the Westrex 45/45 system, a choice that led to the introduction of the stereo LP record in the summer of 1958.

It is no coincidence that 1958 was also the year that stereo began to assert its rightful place as the technical and creative center of classical music recording. The blossoming of stereo technique took many forms, some of which crossed the boundaries of company and continents. Several of these techniques represented a revival of methods that had worked well for mono recording. All of them, however, represented a shift from the taste and ears of the engineering laboratory to those of the day-to-day stereo balance engineer.

As we might expect, how fast the experimental style changed to the elaborate one differed from company to company. At RCA, stereo technique had started to change as early as the beginning of 1956, when Lewis Layton had added a center microphone and a woodwind helper to insure the mono comparability of his A/B stereo mix. Layton would continue to develop his sound with further, close-in left and right string sweeteners to begin to create the style that could become his hallmark until his death in 1964.

At EMI, however, the pace of elaboration moved more slowly. From early 1956 to early 1958, EMI's stereo balance engineers were limited to a mixer, the REDD model 8, that contained just two stereo pairs and two further, switchable, mono channels. It took the introduction in early 1958 of the REDD 17 mixer to bring the required flexibility to EMI's opera recording, and to at last open the path to regularly adding A/B stereo "outriggers" and detail-enhancing woodwind spot microphones to the basic picture provided by EMI's Stereosonic microphone pair. It was veteran stereo balance engineer Bob Gooch, whose setup from November 1958, (the orchestra by the way is the Royal Philharmonic with Sir Thomas Beecham - the music overtures by Rossini and Mendelssohn first issued on HMV ASD 420) marked this period as the one in which EMI at last started to make stereo, not simply for engineering reasons, but for "commercial considerations", as well.

"Commercial considerations" were really just a way of saying "stereo more like the other fellow". The biggest other fellow for EMI, of course, was Decca. Yet Decca's own process of stereo elaboration had less to do with its own commercial considerations than with two key individuals whose taste would mold not just how it made stereo, but the way the public at large would come to hear it. One of these men was veteran mono balance engineer Kenneth Wilkinson, who moved to the stereo balancing team in the spring of 1958, and began to deploy his own set of left and right "Outriggers" that he had used so successfully as a single channel engineer. Within a year and a half, Wilkinson would begin to change the Tree itself, and after much experimentation, eventually establish what we know today as The Decca Sound.

The name of the other man at Decca, of course, was John Culshaw. It was his ambitious plans for staging opera in stereo, well-known from his book, *Ring Resounding*, and set out not just in the Ring, but at Decca's recording of Britten's *Peter Grimes* in December 1958, that would at last establish the prominence of stereo over mono in Decca's recording future.

Wherever we look, in fact, 1958 is the year that matters. After engaging free-lance stereo recording in 1956 for the Archiv label, DG, for instance, had begun experimental M/S stereo in May 1957 at Ferenc Fricssay's Munich recording of Beethoven's *Fidelio*. Yet when Karl Bohm recorded Strauss's *Also sprach Zarathustra* in April 1958, DG engineers had already leapt straight from these experiments to a fully blown elaborate style, fielding a pair of Neumann SM-2 primary mikes that were augmented by tympani, horn, brass and organ spots, and their own version of the elaborate style's left and right stereo outriggers. It was an idea of stereo sound, says DG engineer Hans-Peter Schweigmann, who was there at its creation, that simply "was in the air".

I said earlier that none of the eras I have boldly identified had hard and fast borders. We could say that bigger mixers and more recording channels marked the boundary between experimentation and elaboration. No such clear line, however, marks the dawn of the era of convergence. It is an era that we know when we see it.

The best way to see the era of convergence emerge is to use some reductionist shorthand to identify what I see as some of the major convergent styles. First we will see how they differ. Then we see how they were the same. Let us start, somewhat arbitrarily, with EMI: here stereo continued to be based, though not invariably, on center coincident stereo pair, usually though not always KM-56's, plus a stereo pair on the woodwinds, and other detail spots and A/B outriggers; at Decca, the style centered on a KM-56 and then on a M-50 Tree, outriggers and detail spots; at RCA and Columbia, stereo style was based on left, center and right primary mikes into whose master image are added inner string helpers and many detail spots, at DG, stereo style was built around Gunter Hermann's relatively distant main stereo A/B pair of Schoeps M-221's, supplemented by a closer -in and centered SM-2, and also by added left and right outriggers and detail spots.

By reducing these styles to their bare minimum, however, we can also see that each is trying to do three things: capture the full left to right panoply of orchestral strings, maintain a stable center image, and enhance and highlight inner orchestral detail, not merely by where the microphones are placed in the studio, but by changes made to their timbre through equalization by where they were 'pan-potted' into the stereo picture. The sound we hear in the convergent, however, still reflects the kind of microphones that had been chosen by engineers since the beginning of stereo itself. In America, these choices had tended to favor large-capsule models like the Neumann U-47, M-49, M-50 and the AKG C-12. In Europe, the choices were always much more varied, and nowhere more so than EMI, where a particularly loose "house-style" largely depending on the taste of the balance engineer and the needs of the session, encouraged the use of a variety of Neumann and other microphones, ranging all the way from the U-47 to the KM-56.

Paradigms like these, of course, also existed at other companies, too. Yet looking at the Decca Tree or the EMI crossed pair we can see, repeated through thousands of hours of recording, what were obviously considered to be successful models for

making stereo sound pictures. So, in fact, were the very different styles of American engineers, which made plain their obsession with placeable stereo detail at the expense of the sound of the space in which the music was actually being made.

We need to look past these paradigms to see the three factors I believe were instrumental in making the convergent style. One was the need of engineers, and of the producers who often directed them, to include in the stereo sound picture everything they saw in the score, and thought we ought to hear. Of all the solutions to this problem, none was more elegant-or more sustained in its purity - than the Bob Fine/Wilma Cozart adaptation of William Snow's one mike/one channel technique. That Fine has been mentioned so sparingly here is a tribute to the consistency with which he maintained faithfulness to what he - and many others today - consider to be the ideal paradigm for stereo sound.

It took a lot of time to set up and record in the Fine manner. And this leads us to the second reason for the Elaborate technique. That reason was money. It was money, expressed in the form of increased session hourly costs, that made it hard to justify recording in a purist technique, and easy to record in one that covered all the necessary "sounds", not by reseating or rearranging the orchestra itself or by changing the environment in which it was playing, (though the use of gobos and other acoustic modifying devices was by no means abandoned) but by seating microphones next to the musicians you wanted to hear.

There was one other factor, of course, that exerted its own insistent presence throughout the 1960's. This factor was the equipment itself. Some of this gear, like multi-track tape recorders, and newer Neumann microphones like the U-67, U-87 and KM-84, had a direct impact on stereo style. Others, such as high-output tape formulations like Scotch 102, 202 and 203 and Dolby noise-reduction, gave balance engineers the option to move microphones closer, or to use more of them, than the old gear had permitted.

By the middle and certainly by the end of the 1960s, stereo reached its first "maturity". Driven by technique, by the perceived demands of the market, and by the evolving taste of its engineers and producers, the stage was now set for the sound of the 1970's, for quad, and for what became a proliferation of recording tracks that created images which no longer had much relationship to the space in which they were occurring.

Many look on the years we have surveyed as the golden age of stereo recording. Think about the records you treasure the most, and then see how many were made in the 1950's and 1960's. However you view these years, they remain a unique era of unparalleled artistic and technical advance, one that though its achievements remains very much with us today,

## LEGAL ISSUES

### AV ARCHIVES AND DEPOSIT AGREEMENTS

*Catherine F Pinion, Project Researcher*

*Based on the Draft Report for Unesco Project: BOC ref.: 401.729.5*

After the December 1994 AV Copyright Meeting (Contract BOC ref.: 401.714.4) which had been organised by IFLA on behalf of the Round Table on Audiovisual Records (a group of UNESCO NGOS: FIAF, FIAT, IASA, ICA-PAV and IFLA-RT/AVM), a small sum of money remained. In order to further the audiovisual copyright debate, UNESCO decided that this remaining money would be used to work on certain conclusions reached at that meeting. The December 1994 seminar was in itself a follow-on from earlier UNESCO debates on the subject, in particular work on legal deposit by Birgit Kofler who investigated legislation worldwide and formulated model proposals for legal deposit in Legal Questions facing Audiovisual Archives, (UNESCO, Paris, 1991: PGI-91/WS/5). At the December 1994 seminar, it was decided to further this work by collecting and studying existing forms of agreement between archives and donors.

IFLA drew up the following contract, which was subsequently amended given the restrictions on funding (\$6,000 only) and time (3 months). The basic aims remain, however:

[To] follow up the recommendations, of the UNESCO- sponsored workshop, held in December 1994, to examine the legal restrictions affecting access to audiovisual archives, by: -

(a) Preparing a study of existing forms of agreement between institutions which conserve AV records and the respective donor or depositing organisation.

The contractor shall pay particular attention to the terms of deposit agreements including criteria for deposit. In preparing the study, travel to European archival institutions selected in consultation with UNESCO shall be undertaken to assess the effectiveness of current agreements, and the Contractor shall compile and analyze existing documents representing agreement between conservation organizations and donors and/or depositors taking into account:-

- earlier published and unpublished material
- current or proposed legislation defining the tasks of AV archives and of other relevant legislation
- recent technological developments
- current issues in intellectual property.

(b) Proposing a text of standard forms of agreement generally applicable in developing and developed countries for wider circulation and discussion by the NGOs at the next meeting of the International Round Table on Audiovisual Records.

Acknowledgement is given to UNESCO who facilitated the study, to the NGOs who supported the project and to all who contributed, not least to the respondents who sent in information and copies of agreements from their institutions.

#### **LIMITATIONS AND CONSTRAINTS**

Given the time available (3 months) and the limited financial resources, the section which was clearly impractical related to visits to archives and the monitoring of deposit arrangements. As the main aim of the project was to collect as many agreement documents between depositor and repository as possible and to analyse them, the approach that was adopted (and approved by UNESCO) relates specifically to this aspect. Once collected, the agreements would be analysed, and key issues reported upon. Archivists (curators, librarians, etc.) would be asked as to their views on the successes and/or limitations of deposit agreements.

#### **METHODOLOGY**

The methodology adopted was:-

- 1) A preliminary discussion with Wolfgang Klaue, Chairman of the December 1994 AV Copyright Meeting, to discuss developments and the best method of achieving a good response to this study of agreements; also to discuss a draft questionnaire to supplement the enquiry, in recognition that there will be a range of agreements used by different types of archive, and affecting different materials; also that some archives would be unable to forward examples, given the sensitive nature of some agreements.
- 2) The sending out of a letter asking for copies of agreements. This would be accompanied by the short questionnaire relating to the value of agreements. Assistance from the NGOs in identifying the most appropriate institutions would be sought.
- 3) A literature search, concentrating on those references which have special relevance to this field and to work already undertaken by the International Round Table on AV Records.
- 4) A meeting of representatives from all the five NGOs concerned, in order to discuss the findings of the survey and to make recommendations. Members of this group were:-

Wolfgang Klaue (FIAP) Chair

Steve Bryant (FIAT)

Helen Harrison (IASA)

Robert Egeter van Kuyk (ICA-PAV)

Catherine F Pinion (IFLA RT/AVM)

Trevor Pearcey (International Federation of Phonogram Industries (IFPI), was also invited to attend - as a legal representative / rights expert and as a member of the December 1994 AV Copyright meeting. Although unable to attend, he expressed interest in remaining involved with this work.

## LETTER AND QUESTIONNAIRE

It was recognised that a letter alone asking for copies of agreements would not achieve a particularly strong return. Likewise, it was realised that a detailed questionnaire would never suit all types of archive or library - given the different materials and their different copyright and legal requirements. Yet it was felt that if a repository was unable to forward an agreement (for institutional policy reasons), it might be prepared to forward information *via* a questionnaire. The form was deliberately kept short and the questions general in order to allow as much flexibility as possible for each organisation to respond according to its own practice.

As the main aim of the project was to collect as many examples of negotiated agreements as possible, the emphasis within the questionnaire was on information relating to the agreements themselves. In-depth information concerning legal deposit requirements and the formulation of "model legal deposit provisions" has already been fully investigated in a previous report by Birgit Kofler (UNESCO PGI-91/WS/5). References to this report and other relevant literature will be included in this study, where appropriate.

This study looks in greater detail at the contents of agreements.

## RESULTS OF THE SURVEY

The number of letters and questionnaires distributed:- 365 (about 50 were second copies to individuals order to ensure that the questionnaire reached various departments in large institutions)

Number of completed questionnaires:- 107

Number of Agreements/legal statements:- 55 plus several letters outlining the approach by archives.

Amongst the replies were several citing new legislation in progress, or that they will be forwarding agreements once they are translated into English. Most organisations sent more than one agreement. Several respondents welcomed the investigation as they were experiencing problems concerning the management of collections, and access to them.

As in all international surveys, there was difficulty with language and many potential respondents either did not fully understand the enquiry, or felt unable to reply adequately in English.

## ANALYSIS OF QUESTIONNAIRES RECEIVED

In general terms, the return was 'representative' and from a wide range of institutions. It is possible to form a picture of what is happening. In terms of legal deposit, there has been some improvement as a result of the 1980 Convention with more countries involved, either having established deposit or actively considering it. Whilst these figures may be small, this improvement is significant given the lengthy time it takes to establish legislation.

There are, however, certain noticeable gaps especially in eastern block countries and those where there has been/is political turmoil. Because of political unrest, there may be confusion and changes in administration which may indicate new procedures and laws are in progress. Also, a number of countries, known to have a large AV production programmes, are absent from the list, e.g. India, for film (also with new Legal Deposit arrangements),

#### QUESTIONNAIRE: ANALYSIS

##### SECTION A: DEPOSIT METHODS

Statutory Deposit = 37  
Voluntary deposit = 73  
Special arrangement = 54  
Other = 25

Respondents were able to indicate as many categories as were relevant.

Most returns indicated a variety of acquisition/collection methods. It would appear from this survey that the number of countries with Legal Deposit for audiovisual materials has increased slowly since the 1980 Belgrade Recommendations and Birgit Kolfer's study (1990), e.g. Norway, Czech Republic. Many others are preparing legislation. It is a slow process. One of the factors which inhibits legal deposit of this nature is the cost of maintaining a preservation programme, especially in countries with a large AV production rate. This is especially apparent with film materials. (Birgit Kofler's report to UNESCO outlined provisions for a model law and listed the various laws affecting audiovisual archives in different countries).

Voluntary deposit and special arrangements are clearly the most widespread methods of collecting. The British Library's National Sound Archive's holdings indicate a healthy relationship with the audio industry, but even here there are certain stresses (for the industry). The UK is currently seeking a legal deposit law to achieve statutory deposit for the major AV archives. Voluntary deposit can range from the industry depositing items voluntarily to an individual donating items, for which the archive will sign.

Oral History recordings are likewise acquired by voluntary deposit or special arrangement, using agreements tailored to meet each individual case. Research Institutions such as the Australian Institute of Aboriginal and Torres Strait Islander Studies require grantees to deposit field recordings as a condition of receiving a grant. The Imperial War Museum (Sound Archive) requires written agreement over copyright and access.

Other methods of deposit include purchase and transfer. Materials created by an organisation are transferred to its own archive, e.g. broadcasting stations, city archives. Purchase was also quoted by several respondents, mainly to supplement their main acquisition method.

## Which method has been the most successful?

Regarding the success rates of the different methods for institutions, it should be noted that these differ according to material format. Care should also be taken in interpreting the statistics as the absence of statutory deposit indicates that most countries have to rely on other methods, voluntary deposit in particular. Success rates must also be interpreted against the type of institution, e.g. national, local, specialist. However, it is clear that voluntary deposit methods play a significant role in building up all collections.

### SECTION B: AGREEMENTS

This section asked (a) who initiated the work towards deposit, and (b) what were considered to be the strengths and weaknesses of agreements, and (c) how successful were agreements in attracting material to collections.

In most instances, and for all formats, it is the Archive which initiates work towards deposit. Where the depositor has taken the initiative, it is predominantly with film and video materials and in several cases this supplements legal deposit. Government-initiated arrangements relate to legal deposit institutions, such as national archives / libraries; also the BNF/CNC/INA arrangements in France. Certain specialist organisations such as Hrvatska Radio- Televizija, and Kinoteka na Makedonija also have agreements initiated by Government.

### Strengths of agreements

Where there is no established legal deposit for audiovisual materials, negotiated agreements provide a successful means of acquiring materials and still allows the depositor to retain certain rights, if so desired. Agreements differ according to format and will contain whatever is considered essential to protect the interests of both parties - depositor and archive. Examples are:-

#### Film

- UK: - North West Archive
- allows archive to take necessary preservative steps
  - facilitates public access
  - recognises external rightsholders - clearly identifies content/elements of each deposit
  - clear references for depositors

#### Sound

- New Zealand: Archive of Maori and Pacific Music
- The collector/depositor is able to select the set of options which best suit the material, given that it usually represents cultural property, and that the people whose material is contained on the recordings may wish to exercise ongoing controls over it."

Several respondents indicated that the existence of an agreement was instrumental in items reaching their collections and so being preserved.

Only the US Library of Congress qualified their response by stating openly that whilst Legal Deposit for film was very successful in terms of numbers of items deposited, these may not necessarily be their most important acquisitions:-

"From the point of view of artistic or cultural significance, our gifts might arguably be more important ....."

### **Weaknesses**

The following weaknesses were identified:-

- 1) withdrawal of deposited material by the rightsholders without any compensation to the archive - either temporarily or permanently.
- 2) prevention of copying (by archive) of deposited material (even for restoration and preservation purposes),
- 3) Copyright and neighbouring rights awareness by staff.
- 4) Administratively time-consuming in searching out all rightsholders.
- 5) Restrictions on use of the materials (even for educational use, in some cases)
- 6) agreements do not take digitization into consideration
- 7) weak sanctions / sanctions not applied

In a country with one of the highest levels of film production, the Library of Congress has this to say about Legal Deposit:-

"For large donors such as film studios there has been an ongoing problem with access. The studios want unlimited access to their material, while we for preservation reasons, want to limit access to the material to as few times as possible. Because of budget and space problems, we are writing much more stringent agreements with donors than we did twenty years ago. We are also now limiting deposits as much as possible."

This comment relates to the question of "appraisal" of audiovisual materials. Several other respondents referred to the cost of preservation, and whilst "selection and appraisal" is not the subject of this report, reference to earlier investigations and RAMP studies is appropriate.

In smaller countries, and those where films may be limited to Government-sponsored productions (Norway/film, for example), then the same difficulties will not apply. As mentioned previously, many respondents referred to the cost of preservation and the lack of financial support from depositors.

### **SECTION C: PRESERVATION**

This section of the questionnaire sought to ascertain what amount of material was regarded as of archival quality in archives.

Generally, all respondents preferred to store copies, but not infrequently had to make do with second generation copies - though these were often regarded as extremely

high quality recordings. With film, the second generation copy is the norm, as film negatives are usually stored by film laboratories.

It is inevitable that collections will contain all qualities of recordings, as some may be the only surviving copies. Overall, respondents were pragmatic. If anything can be read into this particular section, then the more "national" the collection, the better the quality of material deposited. Half the returns indicated that collections were a mixture of good and poor quality recordings. Broadcasting institutions, because they house their own productions, rate their collections as high quality.

Asked whether the agreements included permission to copy for preservation or access purposes, respondents gave almost equal replies, i.e. replied positively for both aspects. Once again, the Library of Congress (film) summarises the feelings of many respondents:-

"Most of them contain these provisions... I should also point out that the word "access" is used in two ways. In some cases, it means making a copy so that a researcher can view the work. But in some cases, it means the extent to which a donor can get his own master material back to exploit the material commercially. In this case .... the degree of access is often a source of argument between donor and us".

In discussion, the Working Party re-iterated its concern about the deposit of less than archival-quality material and the need for strong government support towards more effective preservation of audiovisual records. The preservation and restoration of "second-hand" materials is three to four times as expensive as preserving the master item itself.

### **Related Materials**

The last question referred to "related materials". So often these are overlooked in legislation. Or, where there is no AV legislation, the printed part is retained but not the audiovisual element. Yet, these are also a part of the production, and are invaluable for researchers,

The most frequently quoted "related materials" are:-

photographs, stills, posters, equipment, written documents, scripts, promotion materials, music-cue sheets, field notes (oral history), diaries. A few countries indicated that existing laws covered printed materials, but the majority indicated that separate or additional agreements have to be drawn up, to ensure that related materials are deposited.

### **AGREEMENTS**

55 separate agreements were received. Many institutions sent two examples, and one sent 9 examples. The length of each document varied, from half a page to nine pages. In one instance (US: Smithsonian Institute, Human Studies Film Archive), a document concerning the rules and regulations of the institution was used as the basis to which individual forms of agreement referred,

The main function of Radio and Television archives is to serve the broadcasting station. Consequently, their approach differs from that of other audiovisual archivists. However, some stations have agreements which enable their programmes to be accessed by the public, e.g. UK - agreements for a certain number of broadcasting hours to be stored by the National Sound Archive and by the National Film Archive.

In general, the agreements can be divided in FIVE separate categories:-

- 1) Legal Deposit
- 2) Copyright Deposit
- 3) Voluntary Deposit
- 4) Specially negotiated agreements
- 5) Producers' Associations agreements

One institution may operate several of these methods of acquisition.

### **Legal and Copyright deposit**

For the purposes of this report, legal deposit and copyright deposit arrangements can be considered together as they tend to be made with nationally-recognised institutions, with copyright deposit enjoying a greater degree of court protection. FRANCE (legal deposit) and the USA (Library of Congress: copyright deposit) are well-known practitioners of such agreements.

Some respondents are in the process of developing legislation. The National Film and Sound Archive of Australia forwarded two interesting examples of documents they are recommending for use in legislation. These outline very clearly the legal position for both depositor and archive, covering ownership, copyright, withdrawal, use, access, preservation and other issues. One is for depositors without copyright ownership; the other is for copyright owners.

### **Voluntary deposit and Special arrangements**

Voluntary deposit is usually linked with arrangements with the industry. For example, the UK National Sound Archive (British Library) has a special agreement with the British Phonogram Institute, whereby members voluntarily deposit two copies of recordings in the archive. Special arrangements may refer to collections being given to archives or to individual items. Imperial War Museum Sound Archive has a large collection of recordings, many of them "oral history". These recordings have individual agreements, specific to each interview, as it is considered most important that an informant is assured of some control over the use of the material.

### **CONCLUSIONS**

In general, most organisations do not have detailed forms of agreement. The complexities of copyright and neighbouring rights in relation to audiovisual materials are well-known. When it comes to the management of AV collections, and particularly a collection of film, then the legal issues multiply as the depositor is usually keen to retain some control over the use of materials. "Uncontrolled" access is seen as a threat to the livelihoods of producers and therefore agreements or charters are drawn up.

These agreements REFLECT (or are influenced by) a number of factors:-

- 1) The production output of a country.
- 2) The political situation.
- 3) The existence or otherwise of legislation - though it should be noted that legislation alone does not ensure deposit.
- 4) The ability of an archive to offer appropriate facilities (access) and storage conditions.
- 5) The Producer Association contracts which are designed to protect the interests of producers
- 6) Whether the item is in copyright or non-copyright

1. **Production output** - Clearly a country with a limited amount of audiovisual production will have fewer items to consider. Similarly, where production is Government sponsored (as is the case of film in Norway) then it is easier to implement legal deposit.

2. **Political systems** - It would appear that there is confusion in those countries which have experienced a breakdown in political systems, e.g. in Eastern Europe (exceptions: Czech Republic, Hungary). This is a dangerous situation for archives, as producers insist on retrieving items for (commercial) exploitation purposes.

3. **Legislation** - The report shows that there has been improvement in the number of countries introducing legal deposit, especially "younger", developing countries. This is also easier to achieve because of limited production. Conversely, legal deposit in those countries with a large production base, have problems in managing and conserving materials. In this respect, the comment by the Library of Congress that they are now limiting the amount of material they take through Copyright Deposit is especially interesting.

Frequently quoted is the ineffectiveness of laws when sanctions are not applied. Whilst legal deposit does help considerably in achieving a good deposit rate in terms of commercial items, it is observed that the more "valuable" (in heritage terms) material which may have been produced privately is consequently more difficult to trace.

4 **Appropriate facilities** - The cost of providing adequate access and storage facilities, especially for film, is one of the major stumbling blocks for legislation. AV materials have a shorter lifespan than printed materials, needing to be copied regularly to new base materials. Providing access copies (to preserve the original) also involves copyright issues, though most agreements tend to include provisions for this.

#### 5. **Producer Associations contracts**

a) Contracts from producer associations are mostly unfavourable to archives, but are often the only way in which an archive can obtain materials. Unfortunately, these contracts may also include quite stringent regulations on the consultation of items.

## b) Council of Europe Draft Convention

Work has been taking place by the Council of Europe on a Convention for Audiovisual Materials, though when this is studied more closely, it clearly relates only to film. For television, sound recordings and other AV materials, therefore, there is cause for great concern. The Draft Convention is extremely important because, if signed, it is legally binding on countries, overriding existing legislation (where it exists).

The existence of different types of agreement also reflects a continued lack of action at national level by governments. Recognition of the importance of audiovisual information carriers in today's educational and cultural "programme" has still to be embodied in most legislations. In consequence, additional factors need to be addressed:-

### **1. The awareness of the NEED to preserve audiovisual items**

There is not the same recognition for audiovisual materials as there is for written and printed items. Traditional attitudes and also economic reasons combine to hinder acceptance of their place in the information world and their cultural influence in societies.

With regard to preserving them in accordance with legal deposit legislation, there is a wariness both by the State and by the depositor. The State is concerned by the cost of preservation; the depositor is concerned by the fact that his control of access will lessened.

Both attitudes reveal a reluctance to tackle the broader issue of how today's audiovisual cultural inheritance - which is increasing at an alarming pace - will be preserved.

### **2 . Insufficient financial support**

Using "economic cost" as a reason for not advancing legislation for deposit needs further examination. Clearly, there does need to be a financial commitment by the State if legal deposit and the subsequent preservation programme is to be truly effective. The enhancement of funding to support the preservation of audiovisual materials is a difficult political issue. Yet, it must be addressed.

Even within organisations, the erasure of tapes so that they can be re-used is another economic factor. In erasing tapes, the original (and maybe only version or copy) is destroyed. How can this be addressed?

### **3. Trust between producers/manufacturers and archives**

There is a great need for better understanding of the role of archives. Producers are concerned about the possible loss of revenue by making their materials more widely accessible. Yet, they also need to realise that archives can contribute greatly to the industry; that by working together they can both achieve their objectives. Once trust

is established, there is a more positive outlook. Agreements help to secure this, but they must not be one-sided agreements.

#### RECOMMENDATIONS FOR AGREEMENTS

As most agreements relate to the specific purpose of institutions, one "model" agreement is difficult to draw up. However, in discussion it was agreed that certain elements should be included in any Agreement. Deposit agreements may relate not only to voluntary or special deposit, but also to items transferred from one institution to another,

Using the Australian National Film and Sound Archive documents as a basis, the key elements should be:-

##### **1. Definitions**

Meaning of words used in agreement, e.g. archive, depositor, deselection, [national] collection (if related to a specific institution)

##### **2. Deposit**

Conditions of deposit arrangements - this may include time limits.

##### **3. Ownership Of Deposit Material**

Clarification as to who owns the material deposited and who owns the material made for preservation at the archives expense.

##### **3a. Transfer**

If transferred from another institution and/or country, details concerning its origin, and ownership rights.

##### **4. Copyright and Property**

Any implications of deposit in relation to copyright, also the responsibility of the institution to contact depositor regarding use of material (transfer, performance, etc.)

##### **5. Deselection**

Statement of institution regarding deselection policies which may include an undertaking to return material to depositor. Time limits can be set for the return of such material.

##### **6. Permanent Withdrawal of Deposit Material**

(only where appropriate)

This section to be drafted in accordance with the Unesco 1980 Recommendation for the Safeguarding and Preservation of Moving Images.

Withdrawal would depend on the method of deposit. It should not be seen as an automatic right. Items deposited under Legal Deposit legislation should not be withdrawn by the depositor, however, items deposited voluntarily should be subject to careful agreements between depositor and archive regarding withdrawal.

This section would therefore include clarification as to the rights of the depositor to withdraw material. It would also include the conditions of such withdrawal, e.g. whether the archive may exercise a right that the depositor pays the cost of storage and preservation.

There also needs to be clarification as to the destination of materials/copies made for preservation at the archive's expense ( see also para. 3). If later returned to the archive, then the archive may decide to reimburse the depositor. This needs stating.

## **7. Temporary Loan From The Archive Of Deposit Material**

Amount of notice required by the institution for the withdrawal of material. Time period by which material should be returned. Conditions of withdrawal may include a charge for storage and preservation.

## **8. Passing Of Ownership Of Deposit Material**

Clarification as to who will own the material after 50 years (70 years, EU legislation). Also, an undertaking by the archive to notify the depositor.

## **9. Use Of Deposit Material**

Details as to the use of the material by the collecting institution. This will include details about public access, exhibition, preservations / restoration.

## **10. Preservation**

Details of the institution's responsibilities to the depositor in terms of preservation work.

### **10a. Costs**

Clarification as to the range of services offered by the archive free of expense and those for which costs are involved and are payable by the depositor.

## **11. Access**

Any elements which may affect the level of access to materials. This will relate to the institution's own purpose (national, local or private collections, broadcasting, educational, etc.)

## **12. Intellectual Property Indemnity**

(for copyright owners)

Agreement by the institution not to infringe the intellectual property rights of the depositor. Also, terms to indemnify staff of the institution against any legal action which might be taken against them.

## **13. Agreement Indemnity**

Similar to (12), the difference being that both parties agree to indemnify each other.

## **14. Liability And Insurance**

Statements as to the limit of responsibility of the institution regarding damage (from whatever cause) arising from storage, transportation, or during copying and other preservation treatments.

(The Australian Agreement indicates that failure to agree to this will constitute a waiver of insurance by the depositor and a release of the Archive from any liability for damage of loss.)

## **15. Waiver**

Clarification of position of institution should this particular agreement be breached.

## **16. Notices**

Details of whom to contact, with names and addresses. Also the responsibilities of both depositor and institution to notify changes of address.

## **17. Applicable Law**

Details of related laws (where applicable).

## **18. Entire Agreement**

Final sentence committing depositor and institution to the terms of the agreement, followed by their signatures (and date of agreement).

There will then follow a full description of the items deposited.

# TECHNICAL

## TECHNICAL APPRAISAL OF TAPE COLLECTIONS

*Steven Smolian, Sound Preservationist*

Paper presented at the Joint Technical Session of ARSC/IASA during the Washington IASA/ARSC/FIAT Conference, Washington DC 1995

Among the formidable tasks facing any archivist or curator is deciding what to preserve, what order to preserve it in, and what size chunk of that first batch can be preserved with the funds available or are being applied for.

Audio materials come to archives with the added complication of probable incomplete, imprecise or unreliable identification on its container. Unlike paper, looking at the object itself reveals little further of its content unless there is written data on the disc or tape reel, assuming that was the labelling which originally belonged there.

In this best of all possible worlds, every item in each audio accumulation is completely annotated on the container. Each TAPE contains what its box says it does and in that same order. Each DISC has a label which accurately and completely identifies what is on the record, and has never fallen off and been attached to the wrong side or wrong disc. All dates are accurate as are all the spellings. All items which are part of a sequence are properly numbered within that sequence. Visual inspection discloses at what speed the carrier plays. We know before hand how many tracks are on each tape as well as its playing time. The media will be in the same wonderful condition as the day it was recorded. Tape will be properly flat wound and have no splices. Discs will have no grunge on their surfaces. Everyone within the archive will agree on what should be preserved, in what order, and why the archive is saving this material anyhow.

So much for fantasy.

All audio media are deteriorating. Many of the more aged items are well past their designed-in survival time. And then there is the human element.

Even if you are correct in assuming the data on the container applies to what is inside, it may lack enough detail to enable you to place the item in context without playing the darn thing. Is this item complete in itself or does it fit into a sequence of similar items. If the latter, where does it go? Spoken word collections can be particularly vexing if there is no established order. Long events such as conventions, legislative or court proceedings or interviews can change meaning if the chronology is disturbed. The value of sound recordings to a researcher is greatly enhanced by identifying the sequence of the audio parts before he sits down to listen.

A poorly identified audio item is intellectually opaque. No one can look at a roll of tape and hear it in the mind's ear as one hears the words from a printed page. A properly adjusted playback device is required. Tapes and discs usually have to be reproduced at near their original recording speed to be comprehensible. Evelyn Wood has not yet marketed a speed-listening course nor has the White Knight one for listening backward.

But we have now entered a world where playback devices for the products of most once widely available recording technologies can no longer be purchased off the shelf. Looked for a tape recorder capable of playing back 10" reels at 1-7/8 ips lately?

Even should the playback device be the proper one to reproduce your disc or tape, changes in the media-accumulated dirt in the grooves and the leached-out byproducts of aging- and time and wear induced alterations in the minute dimensions and tensions of an unrestored and unrecalibrated playback device, may damage or destroy the carrier. Old splices come apart. Piecing together shards of tape requires skill and a whole lot of patience. The soft grooves of acetate discs can easily lose their high frequencies, if not exhibit more crippling damage, when reproduced with a misfitted and misweighted stylus. Unless your archive is properly equipped and maintained, you really shouldn't be playing these back at all.

### **WHO PLAYS THE MATERIALS BACK?**

An APE (audio preservation expert) should be able to handle your media so it has much less chance of being destroyed during restoration and preservation. Though we have all made recordings at one time or another, there are many tricky aspects of audio playback of older carriers which require the considerable technical experience and skill that APE brings to the job.

Yet archivists are the ones with the specialized content knowledge and thus have a better shot at figuring out what is likely to be on a tape than an outside technician. They are the ones who can more easily place the audio into its appropriate intellectual framework. They have access to the written documents which will support the exploration of future researchers of these materials. If the object of this exercise is to create a preservation transfer which is easily accessible to and understood by the researcher, what strategies are available to reach this goal?

The APE will have the content window open, perhaps for the first time since the recording was made. He will be hearing the materials that you have given him to restore and copy. The archivist can help him identify what he is hearing, help place it in the context the archivist desires, supply him with a way of coordinating what he hears with already established events (give him transcripts, etc.) and, using or creating appropriate identifiers (dates, page numbers from transcripts program books, etc.), give him the means to fit the audio content into its proper contextual position within the archive's overall holdings. In other words, a subject-sensitized APE can make a rough catalog while that window is open. I'd like to say something about the relationship between cataloging and archival longevity. Audio materials are best stored under environmentally appropriate circumstances. Once shelved, the less handling the better. Every move involves the possibility of temperature shock, the most destructive non-catastrophic event which these media have to endure. The more specific and detailed the cataloging, the less each item will be called for, since it is no longer necessary for a researcher to hear a large group of items to fish out a desired

portion. Such cataloging should include data not normally called for by the present professional cataloging rules but which are essential to identifying the recording event. It is my strong belief that professional catalogers should spend appropriate time to determine each recording event's date or a reasonable approximation thereof. When all recordings are considered as documents, how much more useful is a dated newspaper than an undated one?

The cost of better cataloging is repaid by the reduced handling generated by the fewer number of items a researcher has to play through to find what he seeks. The benefit to the archive is the consequent reduction in the number of times vulnerable materials unnecessarily move in and out of their benign environment. 'Preservation Cataloging' which supplies data to meet the end users' requirements as well as that administratively necessary will generate considerable benefits not only by protecting the materials, its primary function, but increasing staff and user efficiency.

Well, how do you figure out what runs at what speed, what number of tracks, what condition everything is in, and how much it all costs? The practical solution is to have a survey made by an APE, either a staff member or a consultant. Sometimes this may take more than one visit, the first to get the lay of the land, an interval to assemble appropriate playback equipment, then a longer visit to perform the analysis. However, a productive cross-examination by telephone can usually generate enough data to keep this to one trip. The APE's analysis should focus on the problems and consequent costs of migration of sound from the old carrier to a new one. There are two types of engineering services available. First is that of the transfer house. What you send out is what you get back, only with an extended lifespan. This service concentrates on moving the sound from one carrier to another, NOT on its content.

The second is performed by an engineer who also acts in your stead and who combines the attributes of the copying service with content awareness. This latter is a custom service; the former is closer to a production-line. Part of the consulting process is to determine a balance between the two based on the original materials, their content and condition, and how they have been documented in the past.

It is quite helpful to your APE to help him toward understanding something of your institutional history, its aims - how the finished product fits in with your overall program- preservation, teaching and research- and who your organization's heroes and villains have been and now are. This is particularly true of spoken material collections. It also helps to give him the lowdown about the functioning of and, perhaps, even introduce him to those at the financial end of things. Certainly, if you anticipate submitting a grant proposal, he should be working with the development people at your institution.

Should you be contemplating sending a project out for bids, then, when the final specifications are listed, they should be drawn in such a way that all bidders are basing their proposals on performing the same steps on those originals. Further, minimum standards should be included for the studio. These would include keeping the air conditioning and heating systems running 24 hours wherever any of your tapes may be in the pipeline. Another example: some studios claim they are recording full track mono when they are actually recording mono on parallel stereo channels, the way the machine usually comes from the factory. The guard band between the two tracks results in a nearly 4 db signal-to-noise ratio loss. An additional set of full-track heads is not only more expensive but also requires either a separate, dedicated full-track

recorder or a lot of head-switching and retweaking, adding to studio overhead. This is a place the bean-counters will try to fudge. Yet engineers will kill to pick up a db or two of lower system background noise.

Beware of substantially lower bids- equipment costs, the continual need to upgrade, and maintenance time don't allow too much leeway, so very low bidders may well be cutting essential corners or may not fully comprehend what the process really requires. The expression, 'best QUALIFIED bidder', really has meaning here.

How do you know if the amount you are asking for will cover the cost of what you are told it will preserve? The initial consulting stage should result in an idea of what is required to all your needs. Each group of discs and tapes will need to be identified and processed in a particular way, employing a group of operations, each of which requires a sequence of steps, each adding a time and materials factor to the time required to process an individual item, extending it to a batch of similar items.

Some steps can be performed simultaneously, some partially so, and some must follow preceding ones. Designing the most efficient probable sequence of studio production steps which meets your preservation objectives is where your APE can be highly effective.

From the curator's standpoint, much depends on the choice of the engineer who performs the task. We are all self-promoters, in a tiny field, and well known to one another. We all have high opinions of ourselves, slightly lower ones of our competitors. A list of credits and reviews is fine, but it is much more useful to know how well satisfied previous clients have been after the job has been completed. Check references.

How good is the finished result compared with how good it could have been? There are no academic courses for training audio preservation engineers. The concepts underlying the entire preservation process are an inversion of the mental attitude with which graduates of most recording programs are launched. OUR goal is long-term preservation, not immediate exploitation. OUR goal is to-be able to play it back 20 or 30 years down the road, not to allow yourself to be steered toward use the latest "best 10 technology," even when demonstrably superior, if it is not already well established in the market. I can think of few things more frustrating than perfectly preserved software and no hardware to hear it on.

Your APE must be well acquainted with the technical and marketing history of each of the media on which he is working before he allows your precious artifacts to come into physical contact with your or his equipment. Nor is there a place here for the engineer to introduce his own creative sonic imprint. Fidelity - now, there's an old-fashioned word.

So what can your consultant do for you? Well, first off, he should look at the materials, help divide them into work groups, and give you an idea of what each segment will cost to preserve. This can be based on the work being done by an outside studio, often his, or by setting up an in-house system and his furnishing aid toward the training of the personnel to administer and operate it.

Here are some of the problems I have encountered along the way.

In one collection, it was unclear if a musician's name on a tape box indicated if he was performing or was being interviewed. When played back to determine which, some turned out to be edited and unedited interviews and some were performances -with and without radio announcements spliced in. The private funder wanted both, but only those pertaining to a specific conductor, and wanted the interviews and music differentiated. They had all been recorded on acetate based tape during the 1950s and '60s. Many splices had dried out and had to be remade during this initial auditing process, just to get far enough into the program material to identify it. Fortunately, the University recording service had a working tape recorder (which we demagnetized and cleaned first) and a splicing block and tape so I could reassemble as I went.

A very large archive was having problems with its tape masters - unique items with no back-up copies- from the mid-late 70's to the early '80s- which were squealing during playback. It turned out that there was muck, generated by oxide shedding which had been initiated by hydrolysis, which accumulated in the tape head gap and in the tape guides, changing their effective dimensions and causing enough friction so the tape vibrated like a violin string, the aural result of which was a clone of blackboard-generated chalk squeal. Some guides were so gooey from the accumulated debris that they stopped the tape from moving from reel to reel. There were NO cleaning materials in the archive so the junk from a bad reel was making even the good reels 'sing'. The problem was traced to one brand and product number of tape, and those in their original boxes were targeted for attention- almost 10,000 reels of them. But there had been a flood in an old storage facility, and some tapes had been repackaged into generic boxes. It was necessary to test-play many of these, particularly those within the recording dates into which years all the other bad reels fell, to see if they also squealed and should thus be added to the list of reels needing treatment and copying. They were, they were and they were.

Another large tape archive of spoken material had tapes recorded at the very slow logging speed of 1-7/8 ips. A normal 2400' 10" reel holds 4 hours of audio at this speed, 8 hours if recorded half track on both sides of the tape. However, there were years where they had used .5 mil ultra-thin tape, thus holding 12 hours per side. Many are recorded on each of the two tracks, making a total running time of 24 hours. Four or 24 hours. It was important to determine the running time of these tapes so a realistic timetable and budget could be drawn up, one which reflected beforehand the engineering time and the materials required to copy them at 7.5 ips.

A disc collection contained much public relations material, including the same program both with and without beeps to indicate where strip films should be manually advanced, both as acetate disc originals and, though differently labelled, pressed 16" discs as well. It was only necessary to copy one - we used one with the beeps since they did not overlap any of the narration or music - so it still could be mated with the film or, if preferred edited later for pure listening. We were thus able to eliminate perhaps 10 sides running about 12 minutes each from the restoration and preservation schedule.

In the same collection there is a long string of convention tapes, some of which were numbered consecutively on the boxes and some of which were more murkily identified. When checking against the published proceedings, which were supplied me by the archivist, I found there were sessions out of order, scattered among the

numbered tapes, part on one, part on a much later one, duplicate reels, partial duplication so I needed to pick up one connective paragraph elsewhere in the mess, as well as two other shorter conventions and a prayer luncheon which ran before and during the main event, with many of the same participants but without any supporting printed text. I was able to isolate these and logic them together, but only after figuring out that they WERE different events. This function would have been considerably more difficult if it weren't for the accompanying printed matter.

A number of years ago I was asked by a major symphony orchestra to take a small core of old radio broadcasts and expand it to create as complete an archive as possible of commercial, broadcast, and non-broadcast but licitly and illicitly recorded musical events. For the older materials which had been heard nation-wide I found instantaneously recorded discs in archives and private collections throughout the country and Canada as well. By investigating the broadcast distribution system, the quality of the telephone lines which brought the program to a given city where there were artifacts, and whether it was taken directly off the incoming transmission line or was sonically compromised by having been broadcast, I was able to figure out which of multiple surviving copies was most likely to be of the highest fidelity and arranged to limit comparisons to these before choosing the one to use as the source original. To deal with the many program fragments, particularly from the early years and in-house recordings, the starting point of the process was to compile a complete broadcast history and discography of the orchestra including the content of each program and index it by selection and performer. So many hitherto untraced events were uncovered that the orchestra's formal history will look a bit different the next time they publish one of those big anniversary scholarly tomes.

It is not only the engineer whose academic training does not properly prepare him to deal with audio preservation. Considering how much of our historical and cultural heritage is in non-paper formats, it astonishes me that there is no academic program anywhere in the U.S. to prepare archival generalists to understand the nature of this aspect of what they will be curating. Though I understand there is an occasional course given along these lines at Syracuse University, I feel it should be part of the training programs of all librarians and archivists. Most will never perform the actual studio work during their professional lifetimes but they will be often administering such projects with little exposure to how these materials function and age, and thus be at the mercy of their preservation fulfillment person. When considering entering upon such a project, be sure to leave time and budget for on-site discussion with the consultant concerning the various available preservation strategies and how they apply to your archival audio materials. Take advantage of this time to resolve any questions you may have about the processes involved. Don't be afraid to appear uninformed. We all know a lot about a few things and less about others. Consider the consultant's visit as an opportunity to expand your knowledge base. The person you have hired is there to help, not dictate. After all, what he does impacts your career. Protect it. Ask questions.

## PROCEDURES

A huge portion of our historical audio legacy is increasingly vulnerable to the passage of time. Set aside on shelves, nestled in their little cardboard houses, snuggled between reel flanges and blanketed by their own outer wrap, tape quietly ages. It is only when the call goes out and the reel has travelled to the tape deck that we discover that it needs therapy. Those acetate discs - what's that white stuff all over its skin?

Recordings differ from paper and still photographs in that accessing their sonic information requires a playback unit between the sound source and the ear. The carrier is only one vulnerable element in a system which also needs properly working hardware, typically functioning on a superseded technology.

Audio preservation entails capturing as much of the entire signal as is feasible, moving it to a new preservation medium with its own finite lifespan, and storing it in such a manner that it will perform well over the duration of that lifespan. Further migration of the signal through future generations of media preservation systems must also be considered.

## FORMAT IDENTIFICATION

When faced with a group of recordings within an archive, the first issue is determining the proper playback format. A glance will disclose the family, of sound carriers to which an item belongs. Flat records are a large subset which include commercial and non-commercial pressed and instantaneous discs. Among others are over a dozen dictating machine formats, wire, cylinders, digital optical discs, audio tape - either reel-to-reel or inside a cassette, etc. The many ways each of these can be cut, tracked, sped and/or encoded requires the attention of an expert. The applicable variation within these possible formats must be identified so the proper playback device and adjustments to it protective to the media can be specified. Many recordings have been seriously damaged through being played back on improper equipment, many more by reproducing them on whatever machine accompanied a recording collection without first restoring the device.

It is inadvisable for tapes to be reproduced on mechanisms which have not been properly inspected, cleaned, aligned and overhauled. Worn heads and guides can scratch the oxide surface, mistensioned feed and takeup reel adjustments can cause tape stretch or breakage, heads not properly demagnetized may permanently add an additional signal and alter that already recorded, etc. Even so, all sound carriers are at least at some risk of damage or destruction caused by time-induced physical chemical alterations.

When media problems occur, it is essential that the operator be well enough trained to decide if what is occurring is extra-usual rather than the ordinary sounds and visual gyrations normal to a particular format's operation. When doubtful, he must be well enough trained to stop the playback process, return the object to storage and mark it for expert attention.

## INTERNAL FORMAT

Audio materials require analysis on an individual item basis; tape playing speed and track width cannot readily be determined by visible inspection. There is a bewildering array of possible speeds and formats. Preservation planning to generalized assumptions about them often results in disastrous budget shortfalls. Is a four track tape recorded with the same information on pairs of tracks or four separate ones? Is the tape 1.5 mils in thickness or 0.5, a difference of between 30 minutes and 1-1/2 hours in the time recorded on each track on a 7" reel at 7.5 ips or, alternately, 2 hours or 6 hours if recorded at 1-7/8 ips, a possible spread of between 30 minutes and 6 hours in the length of the original recording. Discs fall into one of 5 general speed groups and variations within each are considerable. Proper format identification is an essential prerequisite to creating a realistic preservation calendar and budget.

## CONTENT IDENTIFICATION

Only when archival recordings can be replayed on properly restored equipment should they be spot-checked for identification. As unreliable as the documentation written on the protective package may be, it is often wiser to initially assume the recording contains what the package says unless there is significant reason to believe otherwise. Older recordings in all formats should be handled as infrequently as possible. Accuracy of the documentation accompanying a recording will be a function of the circumstances under which it was originally produced; as a rule, those made in a studio will be better labeled than home recordings. Field recordings are usually well identified as to content, less well for technical data.

The more closely the content and circumstances of a recorded event can be identified, the greater the opportunity to organize it with similar groups, allowing assembly of related fragments and offering the prospect of technical uniformity - an item may well share recording characteristics with others made at the same site on the same equipment at about the same time. Processing costs are reduced when the same settings can be applied to a number of items. Defining discrete groups becomes necessary when establishing a prioritization schedule.

## CONDITION

Condition is best determined by an audio preservation specialist with hands-on experience. Though identification of certain problems yields only to playback, expert visual inspection can usually contribute towards a realistic picture of existing problems, what procedure might be appropriate to resolve them, what degree or degrees of resolution may be possible and at what cost. Non-commercial discs have survived well past their anticipated lifetime and may require fairly extensive treatment to allow them to produce the sound quality captured by the best examples of the medium.

Once content and condition have been determined, a balance must be achieved between saving those items in the worst condition and those with the most important sonic information. Realistic prioritization is best achieved by communication among users, archivists and the preservation specialist.

## RESTORATION

It is important to decide how much physical restoration of the sound carrier is possible and how much of that is cost effective within each archival context. The audio preservation specialist should be well informed about the financial implications of these processes required to bring the carrier to each restoration level.

Restoration usually occurs in a studio setting. The objective is to allow the record or tape to make as precise an alignment as possible with the device which will reproduce it. Stiff tape can often be made more supple; processes beyond simple cleaning can be extremely effective when preparing acetate-based discs for copying. Many techniques require simultaneous copying- playing acetate discs while covered with appropriate liquids- or shortly thereafter, as when dubbing tape after baking. This is usually a non - destructive but unpredictable process; nonetheless, if consideration is to be given them as museum objects, it should be a conscious policy decision since it limits the options for getting the best possible audio signal from the carrier.

## PRESERVATION TRANSFER

Preservation transfer quality should be appropriate but not expensively excessive to that inherent in the original materials. There are many, ways and degrees of improving sound, usually a subjective process. The mission of each archive will define the level of desired processing. Should sound quality be adjusted at all, copied twice, once objectively and once subjectively, or only subjectively? "Improvement" parameters should be discussed beforehand. Legal ramifications of certain types of signal alteration may impose limits on sonic options if the resulting migrated signal must stand up to scrutiny in court. The audit trail left by analog editing is not trackable to the same degree when undergoing similar digital processing.

## PRESERVATION MEDIA

Many products use "archival" in their promotional literature but few copywriters have the vaguest idea of an archivist's expectations when invoking this adjective. The consultant should be intensely aware of the differences among products offered for preservation use and the history of each when employed in an archival context.

Preservation copies should be made on 10" reel- to-reel tape at either 7.5ips or 15 ips speed. This is recommended practice by the Audio Engineering Society, the Association for Recorded Sound Collections and the International Association of Sound Archives. Certain tape products have proven more archivally appropriate than others. The audio preservation consultant should be well informed on this vital matter and apply this data when fruiting a project. Further copies may be made on other formats.

Some digital tape systems with highly compressed data have been proving erratic. There are also serious questions about long-term stability of most brands of recordable compact discs. Though anecdotal field reports and manufacturer's in-house test literature is accumulating, no dispassionate laboratory work on either group of digitally encoded audio preservation media has been published.

Though the audio cassette is a useful format in many applications, archival preservation is not one of them. Among its weaknesses are twisted tape caused by lack of dimensional stability due to a narrow thin ribbon being seized by the mechanism, inherent background noise, limited recording frequency and dynamic range, a propensity toward excessive unstable tape motion implicit in the slow recording speed, difficulties with components of the cassette in which the tape resides and extreme vulnerability of the system to sudden environmental changes.

#### **QUALITY CONTROL**

The poor-sounding output of many audio preservation projects is often accepted by quality control personnel because their expectations of the media are so low. Though in some cases this is justified, in many others it allows vendors to escape with shoddy work. To this date there is no program in archival or library professional training which prepares their graduates to oversee audio preservation projects yet they are far more expensive to design and implement than those for most other media.

#### **THE APPRAISAL**

The purpose of an audio preservation appraisal is to:

- > consider the mission of the organization
- > explore contemplated uses of various segments of its audio materials
- > prioritize preservation activities
- > design processes to fit an organization's needs rather than offer specifications written to abstract standards
- > survey the condition of the originals
- > suggest restoration processes required before copying
- > choose appropriate preservation media
- > determine the processes required for each phase of the preservation project
- > specify the steps, time and materials needed to process one item per group
- > extrapolate this data to the whole group
- > plug in normal preservation studio time charges and materials costs
- > furnish minimum specifications for a studio to accomplish these tasks
- > develop documentation and storage specifications
- > consider funding resources and their requirements
- > create a budget to fulfill the resulting program.

#### **THE INITIAL INQUIRY**

We discuss:

- > the approximate number of original tapes, discs, etc.
- > their formal acid approximate quantities
- > general condition
- > the portion of reel-to-reel tapes which may be paper, acetate or polyester backed
- > what disasters portions of the collection may have experienced
- > if tapes are likely to have splices which may require repair
- > how materials are organized, cataloged or, if not, what finding aids may have accompanied them
- > if each tape box is numbered and if the tape within has a matching number as well

- > the overall history of the collection or collections
- > the reason for having each segment of the collection within this institutional purview
- > what future plans you may have for the sound they contain.
- > how important various sections of the collection are to constituencies within your institution.
- > how unique these materials may be
- > legal and other strictures which may affect disseminating its content.
- > the means by which the sound will be migrated
- > the need for processing and editing the preservation medium or media

Answers to many questions raised during this preliminary conversation affect the requirements and attitudes of various funding sources and thus the appraisal's structure. There is no charge for this conversation. At its conclusion we discuss how much time will be needed to perform the on-site appraisal and the cost.

#### CONSULTING AT THE SITE

The expert visits the site to inspect the artifacts, often bringing appropriate playback equipment, and further discuss matters raised in our preliminary phone conversation. These discussions might also include faculty members, institutional preservation officers and members of your fund- raising office. The objective is to develop a specific methodology for preserving various sections of the collection, grouping the materials, prioritizing the groups, and creating a budget based on hours of required studio time and quantities of materials. The inspection may entail anything from a casual glance to extensive item- by-item inspection. Costs can often be reduced by performing some elements of organizing and listing before I arrive.

#### THE CONSULTANT'S REPORT

A report is then prepared which offers strategies based on decisions reached during our discussions, a plan and a budget. The report describes a studio's minimal technical requirements, the procedures to be followed for each group of problems, cost in hours per unit and the number of units likely to be included in each section of the project, resulting in a projection of required time and materials. These numbers are translated into dollars. Future storage requirements are covered. If you wish, it discusses factors which may affect what portion, if any, might be performed on site by local labor, what equipment and training would be needed and their costs. The next step is usually for the institution to create a proposal based on this report.

#### *Editor's note*

This article is a combination of Steven Smolian's paper given during the Washington DC conference and a technical brochure produced by the Steven Smolian Preservation Studios. The paper indicates the **why** and the **what** as well as the practicalities and realities of the work involved, the procedures are appended to indicate the **how!**

## PRESERVATION OF AUDIO AND VIDEO MATERIALS IN TROPICAL COUNTRIES

*Dietrich Schüller, Phonogrammarchiv, Vienna*

Motto: Beware of high humidity and buy a hygrometer first!

Audiovisual data carriers play an ever-increasing role in the realms of information, communication, cultural documentation and research. With the vast spread of modern technologies, the wide field of the audiovisual domain has become an indispensable factor in every country around the world. In the course of this development, audiovisual collections have mushroomed almost everywhere, with each collection containing irreplaceable documents of unique historical and cultural content.

Beyond the world of modern, "international" entertainment, audiovisual documents are the only suitable records for otherwise undocumentable, orally transmitted cultures and arts. Thus, this kind of documents are an indispensable prerequisite for the representation of the world heritage in all its multicultural aspects.

It is now well known that audiovisual data carriers are prone to decay. Standards have been defined to help slow down the progress of this decay in order to prolong the life of this precious source material. The parameters of these standards have been defined within the prevailing environmental and economic framework of developed Western countries with moderate climatic conditions. Many of us have discovered, however, that, in tropical countries, audiovisual data carriers often have greatly reduced life expectancies. This paper will examine the reasons for this unfavourable situation and suggest measures to overcome at least some of the problems by observing simple, adaptable methods. The views of the author are based on the experience gained from a series of missions to African, Arabian and Caribbean audiovisual archives.

Before discussing the situation of tropical countries it is advantageous to generally survey the parameters relevant for the stability and integrity of audio and video carriers. Almost all audiovisual carriers (with the exception of the metal parts of mass produced audio or video discs) consist of polymers which are inherently unstable. All preservation measures can be defined as measures to retard decay as a consequence of this inherent instability and to prevent additional risks over what is defined to be "normal" conditions to their chemical, mechanical or - where applicable - magnetic integrity.

The generally accepted recommended storage and handling conditions can be summarized as follows:

1. The maintenance of low and stable temperature and humidity values.
2. The elimination of dust, fingerprints and other kinds of foreign matter.
3. The prevention of mechanical deformations.
4. The control of light and ultra violet radiation.
5. The control of magnetic fields (for magnetic carriers).
6. The use of well maintained replay equipment.

In principle, parameters 3 to 6 are as easy to achieve in tropical conditions as in temperate conditions. This is not the case, however, with temperature, humidity and dust. These parameters will, therefore, be examined more carefully in view of their influence on the stability of audio and video carriers <sup>(1)</sup>.

#### TEMPERATURE AND HUMIDITY

Before dealing with their influence on data carriers it must be explained that temperature and humidity are inter-related. The higher the temperature of the air, the more water it can hold in gaseous form (vapour); the colder the air, the less water it can hold. Put another way, the same, absolute amount of water at higher temperatures gives a lower Relative Humidity and at lower temperatures a higher Relative Humidity (RH). When the temperature is lowered, the Relative Humidity increases until the saturation point (100% RH) is reached. This point is also called the Dew Point because at that, and lower temperatures, water vapour condenses on to the surfaces within the environment. It is important to understand that the Dew Point is reached when, for example, air at 70% RH is cooled, without dehumidification, from 30°C to 24°C.

The speed of chemical processes is temperature dependent: the higher the temperature, the faster the chemical process. Aging is a chemical process and, therefore, the long-term stability of polymer carriers is, in principle, dependent upon the temperature of the environment in which they are kept: the lower the temperature, the longer the life expectancy; the higher the temperature, the shorter the life expectancy.

Water, omnipresent in the form of humidity or vapour, is - in the case of polymers - another agent working towards their degradation. Several decay processes are due to hydrolysis, a process whereby the long polymer molecular chains breakdown thereby altering their chemical and physical properties. Different polymers vary in their susceptibility to hydrolysis and the process is influenced by different factors in different polymers. However, the more water that is available (and the higher the temperature), the stronger its action and, again, the shorter the life expectancy. There is a trade-off between humidity and temperature: higher humidities can be compensated for by lower temperatures, and vice versa for the same hydrolytic effect.

The most prominent and widely discussed hydrolytic process affecting audio and video carriers is that which affects some types of magnetic layer binders used in some magnetic tapes. The binding properties are reduced and the tape becomes sticky and sheds oxide particles resulting in clogging of the replay head (colloquially known as the "Sticky Tape" or "Sticky Shed Syndrome"). This causes deterioration or even loss of the playback signal. To date, the only tapes affected have been some produced since the mid '70s. Normally such tapes can be stabilised to make them playable for a short period and, thus, provide sufficient time for the tapes to be copied. In severe cases the magnetic layer can be shed in flakes of varying size with consequent complete loss of information (Bertram/Eshel, Bradley, Gilmour/Fumic, Smith)<sup>(2)</sup>.

Corrosion is another water-related chemical process. In theory, metal particle tape, as used for many video formats and for R-DAT, is prone to corrosion of the magnetic layer (Hayama et al, SONY). It is noteworthy, however, that, so far, no significant reports of such corrosion have been received, not even from countries with a very adverse climate.

Beyond the sphere of chemistry, high levels of relative humidities can cause secondary problems. They support fungus growth, whereby fungus reacts with the surfaces of many audiovisual carriers, especially with the magnetic layer of tapes. In the replay process fungus accumulates on the replay heads of audio and video machines, causing head clogging and thus disturbing, if not hindering, the replay process. In severe cases fungus can destroy the magnetic layer. Another unwanted non-chemical humidity problem is condensation on the tape surface if the Relative Humidity reaches 100%. This can cause severe replay problems, especially with all rotary head formats (video and DAT). It can also lead to adhesion of the tape to the head-drum which may cause damage to the equipment.

Temperature and humidity also have an influence on the dimensions of carriers. Generally the volume of a carrier increases with higher, and decreases with lower temperature and/or humidity <sup>(3)</sup>.

Finally, higher temperatures result in a faster rate of increase of signal print-through on magnetic tapes <sup>(4)</sup>.

From these facts the following general rule can be derived: for the extension of life expectancy, temperature and humidity should be low. With respect of the mechanical influences of these parameters, in order to prevent, especially with tapes, mechanical deformations caused by stress or undue relaxation, the chosen temperature and humidity level should be kept as stable as possible. Additionally, high levels of RH must be avoided in order to prevent fungus growth and mechanical replay problems.

It must be noted that there is no ideal storage condition per se. Each recommendation is a compromise between:

- \* The rate of decay of the carriers.
- \* The frequency of use of the carriers.
- \* The requirements for health and convenience of the archivists.
- \* Cost.

Current internationally accepted recommendations propose temperatures around 20°C with maximum (annual) fluctuations of 2-3°C. The recommended humidities have been steadily lowered over the last few decades. As a consequence of magnetic layer binder break down with modern tapes since the mid seventies ("sticky tape" or "sticky shed syndrome"), humidity recommendations have dropped from a maximum of 60% to 40% RH and lower, with maximum fluctuations of 5-10% RH.

These standard recommendations, which are quoted now for all audio and video carriers, are a typical compromise made from the perspectives of archives in moderate climatic conditions with the need of frequent access to their holdings ("access storage"). They reflect the general climatic conditions as well as a normal working room environment, which is generally accepted by people living in a temperate climatic zone.

More recently, long term "archival storage" - as opposed to "access storage" - conditions have been defined with lower and tighter parameters, suggesting 5°C and 30% or lower RH for magnetic tape (Van Bogart). Carriers stored under such conditions are, however, not easily accessible as they will have to be slowly acclimatised to a normal working environment before use <sup>(5)</sup>.

Turning now to tropical climatic zones, an outdoor temperature range of 25 to 40°C and more can be observed. Humidities may range from extremely (and for our carriers, favourable) low values in arid zones - but which then create dust problems - up to 100% RH in humid zones during the rainy seasons.

A considerable input of energy and money is necessary to bring down tropical temperatures and humidities and keep them at the values published in our standards. In practice, very few audiovisual archives in tropical areas can afford to keep to these recommendations. The most frequently applied practices are the following:

1. The archivists are unaware of the recommendations, or - for financial reasons - are unable to do anything. The audiovisual holdings are kept without any air conditioning at all.
2. The archivists are aware of the recommendations but have limited funds for air conditioning. They have cooling equipment running during the day, but they switch it off in the evenings and at weekends in order to save energy.
3. The archivists can afford cooling of the air but, because of lack of awareness and/or because of insufficient funds, do not effectively dehumidify their environment. Some of them may think that they are, at least, fulfilling 50% of the international recommendations by cooling down to perhaps 20°C but disregarding effective simultaneous dehumidification <sup>(6)</sup>.

In general, it can be stated that of these three mentioned practices the latter is the worst, and of catastrophic consequence if applied in humid areas like the Caribbean and similar regions. As explained above cooling without effective dehumidification raises relative humidities dramatically. Water condenses in corners without air current, on shelves, and, finally, inside audio and video cassettes. This leads very quickly to fungus growth, and to severe replay problems <sup>(7)</sup>. Video archives employing this method of partial air conditioning reported that cassettes generally failed to play back after between one and three years only!

## DUST

The other factor that creates a greater risk in tropical areas rather than in moderate climatic zones is dust. It is omnipresent in practically all southern countries. It is less annoying, where occurring, during the rainy seasons. Most aggravating is the fact that airiness is one of the principles of personal well-feeling in these countries. Hence, windows are normally left open. Modern office buildings sometimes do not even have windows in our sense but grids made of bricks to allow a constant air flow. Thus yellow or red dust covering floors, shelves, and inside everything, including tape boxes and even cassettes, is the standard scene in many archives and collections in these areas.

Dust is one of the greatest enemies of all audiovisual carriers and their equipment. On mechanical carriers, it deviates the stylus from its path, causing clicks and crackles; with magnetic tapes it causes head clogging, and, additionally, scratches on surfaces of tapes, tape heads and tape guides; with CDs it causes, in conjunction with improper handling (8), scratches which may render the discs unreadable.

#### **RECOMMENDED PRACTICES FOR TROPICAL COUNTRIES.**

Ideally, archives in tropical countries should follow the international recommendations for the storage of audio and video materials. For temperature, humidity, and cleanliness in an "access store" this would mean:

- \* A constant storage temperature around 20°C with fluctuations not exceeding 1°C daily and 2°C annually.
- \* A relative humidity of 30-40% with minimal fluctuations ( 5%).
- \* The absence of dust particles.

Only rich archives are able to follow these recommendations. It must be noted, however, that such low temperatures are considered to be very uncomfortable by local archivists and may, moreover, constitute a considerable health problem. "Archival storage" in Van Bogart's sense would call for even lower and tighter values. In view of the costs that would be incurred, however, their realisation would not happen very frequently.

In order to reach, or to come close, to the above standards, a bundle of measures are necessary. The first and most important is the radical thermal insulation of buildings and rooms housing audiovisual storage areas. Whenever possible, storage areas should be placed in the centre of building, their walls should not touch the outside of the house. Indigenous construction materials, eg like adobe, may be preferable to concrete and the like, additional insulating material may be advantageous. Most important is the construction of secondary roofs and facades, with a gap of several feet between the primary and secondary surfaces, to allow for ample air flows around the primary building. This will prevent sunlight from hitting and directly heating the outside surfaces of the primary archival building. This is a simple and inexpensive but most effective measure. The use of underground storage areas may, in principle, help to reduce energy costs. The high risk of flooding must, however, be taken into account when considering such ideas. They are, therefore, only applicable (and still with great caution!) in dry areas. Generally, tropical rains can be abundant, so sufficient measures to prevent flooding of storage areas have to be provided.

In fighting against dust, the following measures must be considered:

Wrapping audiovisual carriers to individually protect them against dust, eg. in polyethylene bags, must, however, be critically examined for two reasons, especially in tropical areas:

1. Several deterioration processes are autocatalytic: the chemical process produces substances that act as catalysts for the further decay, thus exponentially accelerating the process. This is well-known with the Vinegar Syndrome that affects acetate cellulose and is also suspected with binder hydrolysis (Smith).
2. Equally, if not more important, is the danger of creating a microclimate: elevated humidities may be trapped, or accumulated, in closed environments, causing chemical decay and fungus growth with all its disastrous consequences.

The conflicting demands for airy storage <sup>(9)</sup> and for dust prevention can only be met satisfactorily and simultaneously by providing a good air exchange, using appropriate air-conditioning equipment, in combination with the following radical dust proofing measures:

- \* Tightening windows to ensure a good seal.
- \* Installing air locks at all entrances.
- \* Having terrazzo-type floors. These are easily cleanable and, if dark coloured, make dirt visible and annoying.
- \* Air conditioners must be equipped with effective dust filters which must be regularly maintained.

What immediate advice could be given, however, if financial funds are lacking to provide ideal, "first world" conditions?

Thermal insulation and dust proofing can be provided at relatively low cost and have little or no continuing energy requirement. These should, therefore, be at the centre of all endeavours. As to temperature and humidity, it must be mandatory to control both parameters simultaneously. To this end, the availability of a hygrometer is an essential prerequisite <sup>(10)</sup>. Air conditioning equipment must be chosen that is able to effectively cool and dehumidify the air. If compromises have to be made, temperature must be kept to a maximum of 25°C with the humidity not above 60% RH. If the level of both parameters cannot always be simultaneously achieved, it seems more important to keep humidity within the given limits than temperature. A stand-by generator must be provided to ensure a continuing power supply in case of a failure of the public supply. Whatever measures are to be taken, it is imperative that the temperature and RH values be recorded daily (or more frequently) in order to assess the risk and to take action.

It must be clearly understood, however, that such departures from the ideal climatic conditions will inevitably lead to shortened life expectancies for the carriers.

To improve the situation in the mid and longterm, the following strategies should be intensified:

- \* Development of cooperation on a national, or even regional, basis to establish central archival storage vaults with ideal storage conditions which can serve as repositories for several archives, libraries and other institutions. It is much cheaper to maintain one larger unit at a good climatic standard rather than several smaller units at a less than ideal standard.
- \* Development of international cooperation to establish large scale storage areas in cold climatic zones which can serve as longterm archives for the holdings of tropical countries.
- \* Intensifying, in cooperation with the manufacturers of audiovisual materials, research into measures to retard the decay of such products and to improve their longterm stability even under unfavourable conditions.
- \* Testing the potential of digital mass storage systems for assisting in the preservation of and access to audio and, hopefully, video documents in tropical countries.

While waiting for these strategies to bear fruit, however, the advice given above may help to improve the present situation. The current situation is often aggravated, as has been explained, by actions which are well-intended but in fact are counter-productive, eg. the use of cooling without effective de-humidifying <sup>(11)</sup>. It must be stated once more that the advice given above must not be seen as reduced standards that can be lived with. They are given as tools to overcome the present emergency situation caused by the interaction of two unfavourable factors in many countries:

- \* Disadvantageous climatic conditions -  
    combined with -
  - \* Tight economic conditions.

Under no circumstances must this advice be misunderstood. It must not be interpreted to mean that looser - and thereby cheaper - storage conditions would be sufficient to safeguard the audio and video heritage in the longterm.

## Notes:

1. This paper is a revised version in English of Schüller 1994. It aims at dealing with the additional risks facing audiovisual materials in tropical countries and concentrates on heat, humidity and dust. It does not deal with all general handling and storage requirements. The author refers to literature and bibliographies cited below.

2. Another process of polymer decay due to hydrolysis is the so-called "Vinegar Syndrome". It was discovered in the '80s and affects stocks of cellulose acetate films, causing them to become, initially, limp and, finally, brittle. The decay process produces acetic acid that acts as a catalyst and accelerates the process if trapped in the film can with the film (Brems, Edge, Ram et al.). It has also become evident that the process can affect magnetic tapes with a cellulose acetate base, but not to the same degree as with film. These tapes also become brittle because of the action of humidity on the polymers. This leads to bad tape-to-head contact and, sometimes, irreparable tape breakages when being played (Schüller 1989 and 1993b).

3. With respect to thermal expansion, polyester tapes, wound on a spool, exhibit an anomaly. The polyester tape is pre-tensilized, which leads to different thermal expansion parameters for different dimensions. While the length of the tape is affected by temperature changes by a small amount only, the dimensional changes of the thickness exceed the changes of the length by a factor of about 10. Thus the tape pack of a polyester tape will become tighter with rising temperatures which can lead to excessive pressures and tape deformations, while cooling will make the tape pack loose. Acetate and PVC tapes react in the opposite way. (The author is indebted to Rudolf Müller and Friedrich K. Engel, both of BASF Magnetics, for their help with this point). Hygroscopic expansion of polyester is very low; for acetate cellulose, however, the expansion factor is quoted to be 8-15 times that of polyester.

4. Print-through is only an annoying factor in analogue magnetic audio tape recording. Although, in principle, it has an influence on the longitudinal recorded sound track on analogue video formats, this is, in practice, only relevant for the older two- and one-inch-formats. It does not affect digital audio formats, nor any analogue or digital video signals. It only affects longitudinal sound tracks. It should be remembered that print-through can be greatly diminished by re-winding the tape several times.

5. Current thinking does not encourage the storage of magnetic tape at temperatures lower than 5°C because of the risk of exudation of lubricants which are contained in the magnetic layer. These lubricants lead to head clogging with all its well known consequences. The Library of Congress in Washington is currently planning to systematically investigate tape storage at lower temperatures.

6. In principle, cooling of the air simultaneously extracts water by condensation. Effective simultaneous cooling and dehumidification of an environment, however, requires specialised equipment and measures. Experience has often shown that standard air-conditioners, as used widely for cooling homes and offices - and also used in many small, Southern audiovisual archives - do not, in general, work effectively as dehumidifiers (cf also Harkness). A large part of this ineffectiveness can also be ascribed to improper insulation: any air intake that by-passes the controlled air conditioning channels will not only counteract cooling but also dehumidification.

7. There are indications that lead to the view that excessive levels of humidity may also trigger severe cases of hydrolysis. The Phonogrammarchiv has observed three such cases, all related to tapes that have travelled for long distances in the luggage compartment of an airplane before landing in hot and humid places. Obviously the cool tapes have received after their landing a high amount of condensing water which triggered hydrolysis. Other tapes of the same type that stayed at home have not, so far, exhibited this behaviour. As a consequence of these observations, we now advise researchers to carry both their blank and their recorded tapes in the cabins of airplanes only.

8. It must be remembered that CDs are sensitive to scratches. If their lower surface, the polycarbonate body, is scratched, the laser beam is dispersed and may not be able to track the pits. As a consequence, anything between short dropouts and total muting can occur. Scratching the protective varnish of the upper side of the disc will possibly render the reflective layer unstable, leading also to playback problems. CDs must, therefore, be handled with utmost care and should never be placed anywhere except in a player or in their cases, the so-called jewel boxes. Placing them on an obviously sandy table may lead to their swift destruction.

9. This thought is supported by the observation of Harald Brandes (1992) who reported that even nitrate films seem to survive comparatively well if stored without any air conditioning, but in an well aired environment.

10. A simple precision hygrometer, available for, perhaps, \$40, is good enough for this purpose.

11. It can be reported that, following recommendations from the author in 1992, some Caribbean audiovisual archives changed their air conditioning practices. In a follow-up mission in 1995 it was found that the situation seemed to be much improved.

#### Literature:

Nota Bene: References are given for selected summarizing articles (which contain more complete bibliographies) and to the quoted literature. It should be noted that a standard for the "Storage of Polyester-Based Magnetic Tape" is currently being prepared by the Audio Engineering Society Sub-Committee on Audio Preservation and Restoration (AES SC-03).

N. Allen et.al.: Factors Influencing the Degradation of Polyester Based Cinematographic Film and Audio-Visual Tapes. In: Boston, G (Ed.), Archiving the Audio-visual Heritage. Proceedings of the Third Joint Technical Symposium, Ottawa 1990. 1992

E. Aschinger, Report on Measurements of Magnetic Stray Fields in Sound Archives. In: Phonographic Bulletin 27/1980

N. Bertram and A.Eshel, Recording Media Archival Attributes (Magnetic), New York 1980

K. Bradley, Restoration of Tapes with a Polyester Urethane Binder. In: Phonographic Bulletin 61/1992

- H. Brandes: Are There Alternatives to the Traditional Air-Conditioned Film Stores? In: Boston, G. (Ed.), Archiving the Audio-visual Heritage. Proceedings of the Third Joint Technical Symposium, Ottawa 1990. 1992
- K. Brems: The Archival Quality of Film Bases. In: Orbanz, E (Ed.) Archiving the Audio-visual Heritage. Proceedings of the Second Joint Technical Symposium, Berlin 1987. Berlin 1988
- E. Charles: Breakdown of Sound and Image Carriers in the Caribbean. In: Boston, G. (Ed.), Archiving the Audio-visual Heritage. Proceedings of the Third Joint Technical Symposium, Ottawa 1990. 1992
- M. Edge: The Deterioration of Polymers in Audio-Visual Materials. In: Boston, G. (Ed.), Archiving the Audio-visual Heritage. Proceedings of the Third Joint Technical Symposium, Ottawa 1990. 1992
- J-M. Fontaine: Conservation des Enregistrements Sonores sur Bandes Magnetiques: Etude Bibliographique. In: Analyse et Conservation des Documents Graphiques et Sonores: Travaux du Centre des Recherches sur la Conservation des Documents Graphiques 1982-1983. Paris 1984
- I. Gilmour and V. Fumic: Recent Developments in Decomposition and Preservation of Magnetic Tape. In: Phonographic Bulletin 61/1992
- C. Harkness: Criteria for Air-Conditioning in Audio-Visual Archives. In: Orbanz, E (Ed.) Archiving the Audio-visual Heritage. Proceedings of the Second Joint Technical Symposium, Berlin 1987. Berlin 1988
- F. Hayama et al.: Study of Corrosion Stability of DAT Metal Tape. Paper read at the 92nd. AES Convention, Vienna, March 1992. AES Preprint 3237
- G.A. Knight: Factors Relating to the Long-Term Storage of Magnetic Tape. In: Phonographic Bulletin 18/1977
- F. Krones: Guidelines for the Conservation of Magnetic Tape Recordings. In: FIAF, Preservation and Restoration of Moving Images and Sound, Brussels 1986
- A.G. Pickett and M.M. Lemcoe: Preservation and Storage of Sound Recordings, Washington 1959. Reprinted by ARSC in 1991
- A.T. Ram et al.: Simulated Aging of Processed Cellulose Tri-Acetate Motion Picture Films. In: Boston, G. (Ed.), Archiving the Audio-visual Heritage. Proceedings of the Third Joint Technical Symposium, Ottawa 1990. 1992
- D. Schüller: Technical and Methodological Aspects of the Preservation of Audio-visual Media under Tropical Conditions.  
including translation into Arabic:  
Al-Uṣūl at-Tiḡaniya wa i-Manhaḡiya li-i-Muḡāfaza ʿala at-Tasḡilāt as-Samaʿiya wa l-Basariya. In: Issam El-Mallah (Ed.), The Complete Documents of the International Symposium on the Traditional Music in Oman 1985 (= Publications of the Oman Centre for Traditional Music), Wilhelmshaven 1995, Part 2, 101-110 (English), 115-127 (Arabic).

- D. Schüller: Sound Tapes and the "Vinegar Syndrome". In: Phonographic Bulletin 54/1989
- D. Schüller: Behandlung, Lagerung und Konservierung von Audio- und Videotragern. In: Das audiovisuelle Archiv 31/32, 1992 (1993), 21-62
- D. Schüller: Early Stereophonic Recordings on Magnetic Tape (1943 and 1944) and Their State of Preservation. Paper read at the 94th AES Convention, Berlin, March 1993. AES-Preprint 3523
- D. Schüller: Hitze, Luftfeuchtigkeit und Staub. Probleme bei der Bewahrung audiovisueller Datenträger in Entwicklungsländern. In: For Gerhard Kubik - Festschrift on the Occasion of his 60th Birthday. Frankfurt/Main etc. 1994, 575-583
- D. Schüller: Strategies for the Safeguarding of Audio and Video Materials in the Long Term. In: IASA Bulletin 4/1994, 58-65
- L.E. Smith: Factors Governing the Long Term Stability of Polyester-Based Recording Media. National Institute of Standards and Technology (NIST), Washington 1989
- S. Smolian: Preservation, Deterioration and Restoration of Recording Tape. In: ARSC Journal, 2-3/1989.
- SONY: Archived Stability of Metal Video Tapes, MPG Technical Report, vol. 6
- G. St Laurent: The Preservation of Recorded Sound Materials. In: ARSC Journal 23/2, 1992.
- J.W.C. Van Bogart: Magnetic Tape Storage and Handling. The Commission on Preservation and Access, Washington, DC, 1995
- G. Welz: On the Problem of Storing Videotapes. In: Orbanz, E. (Ed), Archiving the Audio-visual Heritage. Proceedings of the (Second) Joint Technical Symposium, Berlin 1987. Berlin 1988
- J. Wheeler: Archiving the Various Audio and Video Tape Formats. In: Orbanz, E. (Ed), Archiving the Audio-visual Heritage. Proceedings of the (Second) Joint Technical Symposium, Berlin 1987. Berlin 1988

# **SURVEY OF ENDANGERED AUDIO CARRIERS**

*George Boston*

This is a reprint of the narrative of a survey performed by the IASA Technical Committee on behalf of UNESCO.

## **1. INTRODUCTION**

The world of film was the first to become aware of the decay of the polymers used to record sounds and images. A number of surveys were carried out with the intention of, firstly, establishing the size of the problem and, secondly, locating the material in greatest danger of loss. This helped to ensure that scarce resources were employed where they were most needed. With the help of UNESCO, the audio world has now begun a similar investigation.

IASA does not consider that the work is complete with this report. The Association is funding follow-up work to ensure that a clear picture of the world-wide situation is obtained. A French language version of the questionnaire has been distributed to collections in the Francophone world and it is hoped that a German version will be sent to collections in Germany, Austria and Switzerland. Other versions may follow, particularly a Spanish edition for South America.

The results of this survey confirm a number of the concerns that have been worrying specialists in the field. Not least among these concerns is the lack in many collections of the technical expertise needed to identify problems and take action to preserve the sounds. Part of the problem is the great number of small collections, particularly in Europe, North America and Australasia. Many of these are highly focused private collections of commercial recordings and have no long-term security. Other small collections, particularly of unique oral history recordings, are housed in public libraries in a wide range of climatic conditions, usually unsuitable for long-term preservation.

## **2. RESPONDING COLLECTIONS**

Over 800 questionnaires have been distributed and 133 replies from a total of 35 countries have been received to date - a response rate of about 16% (replies are still being received). The relatively low response rate is a sign of the increasing "questionnaire fatigue" that is setting in. The collections that did respond are to be thanked. In many cases it is clear that much work went into completing the questionnaire. A list of collections that responded is attached together with a summary by country. The Reference Number given for each collection is used to identify the collection in the results sheet for each carrier.

## **3. ASSISTANCE**

As part of the Survey questionnaire, respondents were asked if they were willing to offer help to others and on what basis (Total Cost; Travel Costs; Labour & Material Costs) or if they would like to receive a visit or telephone call to help with problems. It was encouraging to see that over 30% of the respondents were prepared to offer

help; in some cases, potentially without charge. Over 40% of the respondents said that they would like assistance. Four "pairings" of collections offering and requiring help have already been set in motion. Others will follow.

Of those wishing to receive help, the vast majority said that they needed advice about storage conditions, digital formats and methods of transferring sounds to new carriers. These are basic matters for any collection and can be the subject of training seminars. Several of the respondents said that they felt the lack of opportunities for training and for the exchange of ideas and views with their colleagues in other institutions. Not every collection can afford to send representatives to the IASA Annual Conferences or to the Joint Technical Symposia. IASA will be willing to assist with the running of regional training seminars but cannot provide the necessary funds.

The list of Responding Collections also shows which collections offered help and which asked for help.

#### **4. SURVEY RESULTS FOR EACH CARRIER**

These Annexes consist of sheets containing the number of each carrier reported by the collections holding them. The respondents were asked to list the carriers in three condition categories - Good; Some Concerns; Obviously Decaying. The number of carriers from each collection falling into each category are given in the attached tables. The total number of carriers in each condition category is given at the foot of the columns.

Not all respondents gave details of the quantities held of each carrier. These non-quantified replies are shown by a star in the columns to the right of the main results section - again categorised as Good; Concerns; and Decaying.

The total number of respondents possessing the particular type of carrier is given in the "Counts" line at the end of each result sheet together with the number of collections containing material within each condition category.

A statistical summary is also given in the Annex.

##### **a. Cylinder Recordings**

Cylinder Recordings were made from around 1890 to 1929 and were the earliest mass home entertainment system. 39 collections reported holdings of Cylinder Recordings. Of these, 34 collections gave the quantity of cylinders in each category and another 5 collections categorised their holdings but without giving numbers. A total of 96855 cylinders were reported of which over 70% were listed as giving concern or obviously decaying.

##### **b. Direct Cut (Acetate) Discs**

There were several varieties of these discs. They were used as a recording medium by broadcasters, commercial organisations, fairground booths and similar operations to record sounds before the advent of tape. Most consist of a backing disc (often of

aluminium but glass, rubber and steel have also been used) coated with a material, soft enough to engrave easily but hard enough to withstand a number of playbacks. This coating was usually cellulose nitrate but other polymers were used including the cellulose acetates, hence the common name of "acetate discs".

The nitrate and acetate coatings are the same polymers as used for motion-picture film and exhibit the same chemical decay problems. As with motion picture film, the polymers shrink with the passage of time if the storage humidity is not correct. The resulting tension that builds up between the backing and the coating leads to crazing of the acetate or, in extreme cases, complete separation of the backing and the coating.

1232118 discs were reported by 39 collections with another 9 collections not quantifying their holdings. Nearly 90% of the acetate discs were reported as being of concern or obviously decaying.

#### **c. Shellac (Commercial 78s) Discs**

There were several types of discs marketed from around 1890 to 1950. 70 collections reported holding 78s. Of these, 55 quantified their holdings and 15 did not. A total of 1709737 discs were reported of which nearly 45% were listed as giving concern or obviously decaying.

#### **d. Vinyl Discs**

These were introduced in 1948 and are just becoming obsolete. The category includes LP and 45rpm records. A total of 3539814 discs were reported by 58 collections with another 18 collections reporting holdings but without quantifying the numbers. Vinyl Discs are one of the most stable carriers available and less than 5% were reported as being of concern or obviously decaying. A number of the collections report, however, that their concern is not actually decay of the carrier but damage caused by playing the disc - groove wear, scratches etc.

#### **e. Acetate Tape**

This was the earliest common type of magnetic tape and was in use from the 1940s to the 1960s. The base is made of cellulose di-acetate or tri-acetate. As with acetate discs it is liable to shrinkage and the "Vinegar Syndrome". 784093 tapes were reported by 36 collections with another 13 collections not quantifying their results. Nearly 60% of the tapes reported were categorised as of concern or obviously decaying.

#### **f. Polyester Tape**

Polyester is the commonest base material for magnetic tape. In addition to its use for 1/4" tape, polyester is used for Compact Audio Cassettes and R-DAT tapes. A total of 2161941 tapes were reported by 70 collections with a further 21 collections not giving details of the numbers of tapes in their possession. Overall, 23% of the tapes reported were declared to be of concern or obviously decaying.

### **g. PVC Tape**

This is also a common type of magnetic tape but its distribution is not as wide as that of polyester tape, being reported from only 18 countries. 1203235 tapes were reported by 19 collections with a further 14 collections not quantifying their holdings. From the replies, it would seem that PVC based tape is more stable than polyester with less than 2% reported as being of concern or obviously decaying.

### **h. Compact Audio Cassette**

Although the compact audio cassette is not recommended for long-term storage of sounds, it is used by a number of collections because of its small size and low cost. The results, however, underline why it should not be used for archival storage with nearly 23% of the holdings reported being classed as giving concern or obviously decaying. 245630 tapes were reported by 20 collections with another 2 not giving quantities.

### **j. R-DAT Tape**

R-DAT is a helical scan digital tape system using 3.81mm wide tape in an enclosed cassette. As with the CD, the format is also used for recording computer data but as a back-up or safety copy of data held on hard discs. R-DAT is not recommended for long-term storage by many experts because of concerns about the life of the format. There are fears that manufacturer's support for the format may be withdrawn relatively suddenly leaving collections with tapes that they cannot play. The format's relatively low penetration into the domestic market means that the vast majority of the machines sold are for professional use. This, however, is a very small number of machines compared to the number of CD players that have been sold.

In all, 85202 R-DAT tapes were reported by 10 collections with another 4 collections not quantifying their holdings. Three collections expressed concerns about R-DAT tapes.

### **k. Compact Discs**

This is one of the latest forms of digital recording and, in other variants, is used for storing computer data and images. It has the advantage for archival collections of being a non-contact playback system - hence without mechanical wear - and being non-erasable. Although CD recorders are now available, they are only just being introduced into collections. The results given here are for commercial discs, mass produced for the public. A total of 318311 discs were reported from 20 collections with a further 4 collections not quantifying their holdings. Two collections expressed concerns about CDs but these totaled 25% of the reported holdings.

### **l. Other Carriers**

Some rare and unusual carriers were reported. Six collections reported holdings of Piano Rolls. These are giving cause for concern with nearly 90% not in ideal condition. The three reports of Music Box Discs - usually made of metal - show that these are 100% in good condition. The opposite is true for Paper Based Tapes and

Dictating Machine Carriers. These are 100% NOT in good condition. One collection reported holding some Philips-Miller Optical Recordings. These are very rare and there is no known working play-back machine in existence.

Also reported were some holdings of Aluminium Discs (40% endangered) and Sony PCM Tapes of various types. Four collections reported a total of 26225 of these with less than 2% of them endangered. One collection did not quantify its holding of these tapes but classed them as being of concern.

#### **m. Image Carriers**

Some collections also reported on moving image carriers. The Film Sound Tracks reported were 505 endangered; the Video Cassettes over 45% endangered; and the one collection reporting Laser Vision Discs reports that they are all in good condition - 0% endangered.

#### **5. SUMMARY**

It is clear that the most endangered carriers are not necessarily the oldest. As formats, the acetate discs and tapes are among those most at risk and need to be copied to a new format swiftly. The urgency is increased because most of these recordings are unique. The formats were not used for commercial releases of sounds. The Dictating Tapes and Wire Recordings also come into this category for the same reasons - they are unique recordings.

The older recording formats - cylinders and 78 rpm discs - were, in the main, used for commercial releases and there is a much greater chance of duplicate copies existing. Although some 78s and cylinders are listed as obviously decaying, the copying priority must, in most cases, be given to the acetate materials. In the case of the acetate discs, substantial numbers are being irretrievably lost each year because the final stage of the decay is unpredictable and catastrophic. The tape decay is a more progressive problem and the tapes can often be restored sufficiently to permit copying.

## Survey of Endangered Audio Carriers

## Statistical Summary

Carrier	Collections Holding Carrier	Good Condition	Quantities Some Concerns	Obviously Decaying	Total	Percentage In Poor Condition	Estimated Total Hours
1 Cylinders	39	28984	13628	54243	96855	70.07	4843
2 Acetate Discs	48	133345	263798	834975	1232118	89.18	61506
3 Shellac Discs	70	942586	753984	13167	1709737	44.87	113982
4 Vinyl Discs	76	3370364	156450	3000	3529814	4.52	2647361
5 Acetate Tapes	49	314576	421685	47832	784093	59.88	392047
6 Polyester Tape	91	1663408	460093	38440	2161941	23.06	1080971
7 PVC Tapes	33	1182635	18600	2000	1203235	1.71	601618
8 Audio Cassettes	22	189305	55825	500	245630	22.93	368445
9 R-DAT Tapes	14	84502	700		85202	0.82	85202
10 Compact Discs	24	238311	80000		318311	25.13	318311
11 Paper Based Tapes	2	10	200		210	95.24	105

Survey of Endangered Audio Carriers

Statistical Summary

Carrier	Collections Holding Carrier	Good Condition	Quantities Some Concerns	Obviously Decaying	Total	Percentage In Poor Condition	Estimated Total Hours
12 Sony PCM Tapes	5	25725	500		26225	1.91	26225
13 Wire Recordings	11	280	171	2000	2451	88.58	613
14 Dictating Tapes	1		136		136	100.00	34
15 Aluminium Discs	2	50	30	5	85	41.18	7
16 Philips-Miller Optical	1			?		100.00	
17 Piano Rolls	6	910	1890	5000	7800	88.33	520
18 Music Box Discs	3	5013			5013	0.00	334
19 Film Sound Tracks	6	550	550		1100	50.00	275
20 Video Cassettes	3	7930	6800	20	14750	46.24	7375
21 Laser Vision Discs	1	700			700	0.00	700
Totals	485	8174031	2225770	996157	11395958		5701361

## ACCESS

### THE VALUE OF INTEGRATED ACCESS TO PRINT AND AV COLLECTIONS

*William Storm*

This paper is based on one which was presented during the IASA/ARSC/FIAT Conference in Washington DC. The original was published in the *IFLA Journal* vol.21 (1995) no. 3 and is reprinted here with the kind permission of IFLA and the author.

The purpose of this article is to present rationale for the collaborative integration of print and AV collections as they will be placed on digital networks. The technology component will be kept to a minimum. The dominant theme will be the impact on archives and by commercial enterprises entering the world of digitized networked information.

The major emphasis will be on three points - one, the collaborative development of integrated digital access to print and AV collections; two, the focus on enterprise-wide solutions encompassing print and AV- and three, the fiscal and operational benefits derived from such an approach.

Please also note this document is not a call for collections to become digitized. Rather, its intent is to show how digital access, when appropriate, can be used to benefit and sustain the missions of library and archive collections. The author is well aware of the many concerns, including, preservation, that must be taken into account in order to appropriately apply digital access to library and archive environments.

#### PROBLEMS

##### Value Recognition and Finance

Experience, direct observation, presentations, comments and writings of librarians and archivists from numerous countries and organizations, all point to a common burden - inadequate operational resources for collections.

These "gatekeepers" traditionally represent their work as fundamental to historical documentation and the preservation of cultural heritage. Others, including those in administratively powerful positions, can simply see the collections and archives as corporate or institutional liabilities. Indifference or actions taken by reactionists or uninformed parties in this latter group can seriously jeopardize a library or archive operation. The politically correct weapon of destruction is most frequently a variant of budget constraints. The attack, however, can be arbitrary based on personal bias or inadequate assessment information.

The archivist and librarian must be able to step back and separate their personal dedication and beliefs regarding their collections from these financial and political

realities. In order to sustain its mission a successful library and/or archive must therefore have a strategy to secure sufficient funding and establish metrics to quantify its effectiveness.

Fundraising, however, quickly becomes an anathema stealing away from concentration on basic collection and preservation issues. On the other hand, and regardless of the nobility of the cause, the achievement of financial stability by any commercial or non-commercial enterprise is only likely to occur with a clear demonstration of value received. This demonstration of value received is not always as apparent as librarians and archivists would like to believe. The audience in judgement and often controlling the funding may have little or no awareness of the collections, receive no apparent direct benefit, have media or format bias, be focused on short term career issues, and/or have fiscal pressures counter to the library's or archive's efforts. The obstacles list is long and varied, but in most instances the conclusion and solution is likely to be the same - make the value of the enterprise blatantly obvious. In commercial terms, the "return on investment" must be compelling.

### **POLITICS, COMPETITION AND PREJUDICE**

An unequivocal show of value is an onerous task. Among the reasons are numerous internal political, competitive and prejudicial factors that impact that objective evaluation of the merits of archives and libraries. Volumes could be written on the conflicts within these communities based on the passions with which individuals and institutions fight to sanctify their own particular areas of interest. This fervour may well serve to enhance and reinforce the efforts of like minded parties, but seriously impedes objective appraisal of differing collections and collection types. Print and the Audiovisual worlds have been and continue to be, in a "cold war." And even within each grouping, AV for example, individual devotion to film vs. sound vs. television, etc. still leaves much to be desired in the way of collaboration and cooperation. There are notable exceptions, the UNESCO Round Table and Technical Coordinating Committee being examples.

By those within the professions the divisions and diversity are often seen as strengths reflecting the ardour devoted to areas of specialization. To others on the outside, including potential funding sources, the perceptions can be quite different. Images of archive and library collections as reclusive operations aimed at restricted patronage are stereotypical.

This latter perception can be an enormous, if not impossible, hurdle to overcome in seeking funding. Being viewed, regardless of how unfairly, as a myopic entity serving only a selected few is not likely to bring sustained support over time.

### **OPPORTUNITY**

The case to be made here is not to denigrate diversity and zealotry for collections or collection types. The objective is to explore one avenue that takes these differences into account and uses them to mutual benefit. The goal is a strategy that provides all of the participants with a complementary approach that clearly demonstrates the value received from their holdings. This environment will need to be compliant with current operations, enrich individual areas of concern enhance preservation efforts,

geometrically improve access, provide metrics for usage and cost/benefit analysis, and generate and/or cost justify revenue.

That environment, and here opportunity, is being created by the commercial marketplace and the knowledge being generated by strong commercial activity in the networked distribution of information and entertainment. These activities have, and will continue to, generate tools and ideas that archives and libraries can use to demonstrate and increase cost effectiveness.

### **CONTENT DIGITIZATION**

Within each domain, print and AV, content can often be intellectually and physically separated from the artifact or media. The words on a page, the sounds on a disc, the images on a film can retain meaning independent of the original format. The content can be transferred to alternate media and still be useful.

The caution is not to describe or imply these alternative forms as equivalents. Whether it's print, sound, still or moving image there are inherent qualities available only in original form, presentation and context. The "gatekeepers" would be remiss if they did not insist on the maintenance and integrity of originals. Also, there are many instances in which content transfer will, for numerous reasons, be deemed inappropriate and/or put originals at risk. There is no substitute for good judgement in collections management.

Given that caution, one transformation that has equal utility and funding potential for both print and AV collections is the provision of content access through digital networks. A key requirement, however is that the databases, systems and general infrastructure that purport to address this dissemination should be format blind. All information types should work with equal facility on the networks. An approach that focuses on only one information type can easily be shown to be technically and fiscally irresponsible. On the other hand, there is tremendous opportunity and value in integrated access to print and AV collections. This is primarily due to the activities of strong related commercial forces aimed at providing information to the mass marketplace.

### **UNDERSTANDING THE COMMERCIAL MARKETPLACE**

In this part of the discussion, the roles of contributing benefactors will be minimized. Instead the commercial business case model will be used with an eye on application within the library and archive communities.

Archives and libraries have users. Businesses have customers. In either case, a user or a customer is the consumer of the information provided. In either case, consumer satisfaction and numbers play sufficient roles in determination of supplier success. The business case is simple - the financial investment must be exceeded by the financial return on that investment.

Until quite recently, librarians and archivists had good cause to state that the manufacturing sector did little investment in the development of technologies that may help with the storage, management, preservation and dissemination of their

collections. The claim was that archives and libraries did not reprint a sufficiently profitable market for such development and investment. The claim had some truth in it.

But markets and commercial interest can change radically and rapidly with technological evolution. Entrepreneurs are quick to look for profitable applications of technologies. This is precisely the scenario that has led to a dramatic turn-about and commercial interest in the holdings of archives and libraries. The maturing of digital technologies capable of delivering information and entertainment directly into consumers' homes and businesses has changed the view of library and archive collections from liabilities, to potential revenue generating assets.

The impetus for this revised view came from an unlikely direction - commercial interest in marketing "movies-on-demand" to households. The technical challenges in networking digitized moving images greatly exceeds that of print, still images or sound. So, it came as little surprise when recognition of the power of digital moving image systems swiftly led to visions of delivery of all information types.

### **THE BROAD MARKET PERSPECTIVE**

Network distributors, and manufacturers of related systems, quickly broadened their horizons on marketable information and system customers,

The commercial customer base became composed of companies, institutions and agencies that were media intensive. These customers cut across a number of industries including but not limited to, education, archives, libraries, global corporations, broadcasting, government, retail, entertainment, health care, cable/telecommunications and the military.

These customers were categorized as media dependent on an 'industrial sized' basis. That is, their concerns are with voluminous amounts of media information, including print, graphics, sound, and still and moving images (video). At this media business level, these companies require highly scaleable systems for media origination, production, management, archiving and distribution. They all were seen as facing three critical issues.

1. a desire and/or necessity to migrate to digital media technologies
2. to do so in a way that enhanced their functional capabilities
3. to do so in a way that offered real competitive advantages, financial benefits and/or substantiated their value.

The ability of the customers to address those issues ultimately was detained to be dependent on their capabilities to provide access to the print and AV information/entertainment they possessed. This held true whether the focus was on videos-on-demand, rare books, sound recordings, cataloging data, corporate records, or educational materials, etc. Holdings, however, were regularly presented as costly liabilities until cost effectively managed and distributed to consumers.

The goal for content providers and producers therefore became to evaluate the potential for digital networks to turn their collections, productions, media warehouses and archives into treasured and marketable assets. The goal of the manufacturing sector logically became to profit by providing the appropriate tools and services to the content providers.

## INCENTIVES

The incentives for content providers to aggressively invest in systems to facilitate access to their productions and archives were never better. The U.S. government support and enormous investments by cable and telephone companies in the 'Information Superhighway,' (The Information Superhighway is also known as 'NII' - the National Information Infrastructure) along with a burgeoning consumer multimedia market, caused the value of media productions and archives to rise dramatically. Media companies began to recognize that information and entertainment content, not the media carriers, will be the determinant purchasing factor for consumers. Quality, quantity, and cost per unit of that information would ultimately dictate success in the rapidly emerging digital networks and CD-ROM marketplaces.

This marketplace was popularized in the press with studies pointing toward billions to trillions of dollars. By 1994, investment trends indicated those forecasts were being taken very seriously.

The 1994 analysis of those investment and market trends provided compelling incentives for manufacturers to meet the needs of content providers. (Table 1)

US. Industrial Outlook 1994 US. Department of Commerce/International Trade Administration

"Multimedia is a broadly defined cornucopia of technologies designed to combine full-motion video, animation, still pictures, voice, music, graphics, and text into a fully integrated and interactive system. These new integrated capabilities bring computers a step closer to realizing their enormous potential. Potential uses include training, education, publishing, entertainment, voice and video mail teleconferencing, public information, and document imaging and archival systems. Although estimates vary widely depending on one's definition, some industry sources forecast a \$13 billion market by 1995.

The amount and availability of information will continue to expand geometrically, creating greater informational demand upon individuals and organizations. There will be an ever-growing demand for new techniques to help us understand and analyse the information that we access and accumulate. Multimedia products blur the lines between several formerly distinct products and industries; computers, software, consumer electronics, communications, publishing and entertainment. Computer, communications, and entertainment companies that have joined efforts in the last 24 months include Time Warner and US West; IBM, NBC television, and NuMedia Corp.; IBM, Apple and Toshiba; and Time Warner and Tele-Communications Inc. (TCI). Two aspects of these alliances are worth noting. First as expected the alliances cut across industries. Second, many alliances are international, signalling that the production of multimedia products will be global from the start.

Item	Worldwide Multimedia Market, 1992-1996 (in thousands of units shipped)		Percent Change (1992-1996)	
	1992	1993*	92-93	93-96**
Total	3,815.4	10,315.1	114.2	26.9
Multimedia Products	1,065.4	3,465.6	225.3	15.1
Authoring Software	728.9	1,726.1	136.8	16.2
Multimedia PCs and Workstations	325.8	1,699.5	420.2	31.2
Networks	11.6	49.0	322.4	72.2
Upgrade Kits	675.0	1,109.5	64.4	-4.7
Peripherals	3,075.0	5,740.0	86.7	32.5
CD ROM drives	825.0	1,720.0	108.5	27.6
Sound boards	1,889.0	3,200.0	77.8	28.6
Video boards	450.0	820.0	82.2	53.9

\* Estimate

\*\* Forecast of annual rate of change

Source: Dataquest, Inc.

According to Dataquest, worldwide multimedia shipments - comprised of multimedia products, system upgrades, and peripherals - are expected to increase nearly 27% annually between 1993 and 1996 reaching 21 million units.

During the past several years, the trend has been toward downsizing from mainframe systems to distributed networks which integrate minicomputers, workstations and PCs into an organization's computing environment. Dataquest estimates suggest that the potential for growth in remote connectivity has not been exploited."

The 1993, 322% growth in networking followed by a predicted 72% rate of change in 1994 was not surprising. Prospects for digitally managed and distributed media looked even more attractive based on newer Dataquest numbers reported in Business Wire, February 15, 1994. A key component of the system, the video server, had the following projection.

<b>Worldwide Video Server Revenue Forecast (video server market — USD M)</b>				
1993	1994	1995	1996	1997
\$ 16	\$ 133	\$ 296	\$ 1,327	\$ 5,189

*Table 2 Sources: Business Wire, Source: Dataquest (February 1994)*

Dataquest was predicting a booming market for the video component with an anticipated growth of \$133 million in 1994 to \$5.189 billion in 1997. Add to that the multitude of customers with the need to integrate still images, audio and text, and the potential revenue grew even further.

In the US, these numbers were in part driven by substantial investments in the National Information Infrastructure by companies such as: US West, \$ 7500 million over two years for broadband networks in Denver, Minneapolis/St. Paul, and Portland-Pacific Bell's \$ 16 billion 'fiber upgrade to make its network video capable'; and Bell Atlantic's plans to spend \$ 15 billion on networks over five years. Add to these Ameritech, Southwestern Bell, Time Warner, Corneast Corp, Cox Cable Communications, Continental Cablevision, and Tele-Communications Inc. (TCI) and others.

In order to see any return on their investments however, these companies and their allies will have to rely on the ability of content providers to cost effectively provide them with information and entertainment.

For some archives and libraries this will prove an invaluable outlet. When allowed within institutional charters, direct revenue streams may be generated. In other cases the audit trails built into the distribution systems will provide substantiating evidence of patron usage. The sheer number of people that will be connected to these networks is staggering compared to those reached via local sites.

What is evolving, therefore, are tools that can be used to great utility to objectively demonstrate collection value and directly generate or justify financial support.

This is not a short term phenomenon. The commercial drive is too strong. In the January 10, 1994 issue of Fortune, in the "Economy" section, more evidence of the impact of networked media was illustrated in a quote from Gartner Group representative, Carter Lusher, "And anything that includes the word network is hot." In that same article, companies specializing in networking such as Novell, Cisco, Synoptics and 3COM were recommended investments by Morgan Stanley principal George Kelly.

Hoover's Handbook of Emerging Companies 1993-1994 supported this investment direction. Wellfleet Communications, a supplier of inter-networking equipment for global areas to digitized information was listed first in Fortune's, 'America's Fastest-growing Companies.' During the first six months in 1993, a 110% sales growth coupled with 149% rise in net income was compared to the same time period in 1992. CISCO over that same time period had a 97% increase in sales with a net income rise of 112%. Companies looking at the utilization of networked technologies were prospering. IDB, the US's largest independent transmitter of sports events showed a 1993 1st quarter earning rise of 208% and a sales increase of 121%, TCI spin-off, Liberty Media Corporation, a very active player in the network delivery arena, had a 447% rise in sales with tripled profits,

Networked media was not the only burgeoning market for digitized media. Producers of CD-ROMs also benefited from the application. PR Newswire, March 7, 1994 reported that research firm InfoTech estimated the sale of CD-ROM software increasing from \$ 5.8 billion in 1993 to \$ 1.6 billion in 1994. LINK Resources estimated that 35% of consumer computers sold in 1994 will be CD-ROM equipped. Dataquest in a February 15, 1994 Business Wire report was quoted as stating that multimedia systems "grew an astronomical 1,833% worldwide between 1992 and 1993, from 127,000 units to 2.46 million."

Standard & Poor's, Industry Reports, March 1994, also correlated well with the contention that a broad and viable marketplace existed with an interest and the means to support investment in digital media systems. Table 3 includes data from that report pertinent to the earlier stated customer-base.

Table 3 plus the preceding documentation define what is truly an enviable, if not ideal marketplace for a company with customer critical products.

Given these incentives, in 1995, companies of all sizes and backgrounds are now scurrying to build products and systems for content providers. Archives and libraries are becoming the direct beneficiaries of long awaited research and investment. The claim that manufacturers are not focussed on their needs has been countered by a broader based, revenue-driven, content provider market.

Performances of Portion of Customer-base Index Snapshot – 2/28/94				
Industry	12 Month Change	36 Month Change	60 Month Change	52-Week relative Strength
Aerospace/Defence	35.7%	50.0%	75.1%	129.6
Diversified Financial	13.4%	69.4%	96.8%	104.2
Broadcast Media	21.1%	57.8%	89.2%	111.0
Entertainments	12.1%	51.4%	140.8%	104.8
Publishing	15.8%	49.2%	31.3%	108.3
Telephone-Comm.	-4.4	52.2%	152.1%	91.5

## Reality Checks

As in all good stories, questions and cautions remain.

First, one must understand the preponderance of commercial investment has been in the creation and control of the networks, not in the specific technologies useful to collection operations. Concerns include:

1. Commercial preoccupation has been with network dominance at the expense of content control
2. The collision of the computing, telecommunications, cable, and media industries,
3. A lack of focus on the needs of the content supplier
4. Poor knowledge of the content provider's business (archives and libraries)
5. Inadequate cross-industry knowledge - lack of computing and AV synergy

In their eagerness for market dominance, companies have put their billions in investments in digital networks at high risk by not investing proportionately in content control. The flaw here is that profitability will not be predicated by the availability of the network, but on the consumers' willingness to pay for the information and entertainment the network can deliver.

To date, there has been minimal investment in the systems appropriate to collection needs - a huge oversight. Compounding the problem is that many companies that are now entering that arena suffer from corporate cultures that can lead to incomplete and inadequate solutions.

There are two major manifestations of these corporate cultural weaknesses. One, many corporations work in what are called vertical markets - i.e. each division or company is specialized in a singular market - medical vs. education vs. entertainment, etc.. This works fine in many instances, but is totally inappropriate in other cases. For example, it would make no sense to have each group in isolation design, build and deliver a telephone system meant to have universal application. Yet, this is precisely what can and is happening in many cases in the commercialization of systems aimed at print and AV collections. The vertical approach has consistently produced complaints from customers who are looking for integration and universal interchange and communications.

The second manifestation of corporate cultural weakness is the desire of a singular entity to 'have it all.' A popular misconception is that there is a convergence of the computing and media worlds. A more accurate statement is that there is great synergistic *potential* for the knowledge and technologies in those worlds. In real life, that synergy is poor. The clamor for a lucrative marketplace is causing collisions, not convergence.

"Convergence has become the buzzword of the US high-technology industries as telephone, cable-television, computer and software companies all work toward creating high-speed, broadband 'Information highways' linking homes, offices and schools.

The notion that these formerly distinct industries are melding into a giant 'information industry' has been buoyed by a plethora of partnerships and alliances that criss-cross industry segments.

Yet it is fierce competition, rather than a meeting of the minds, that is driving rapid changes in the US communications sector and the results, at least in the short term may be more chaotic than cohesive.

US telephone companies are engaged in a battle with the cable television industry. Similarly, the personal computer industry is pitted against the makers of television sets, broadcasters and all who place their bets on TV as the primary vehicle for delivering multimedia services to the home.

As author George Gilder puts it: "The computer industry is converging with the television industry in the same sense that the automobile converged with the horse." He predicts a period of 'creative destruction' as industry segments collide and battle over establishing new roles.

Source: Financial Times, March 8, 1994

The Financial Times article presents a sobering and accurate description of the 'superhighway' revolution. Collisions of traditional computing and AV manufacture are more the norm than convergence.

While these collisions go on, the synergistic potential goes waning and the problem becomes compounded because the real work of customer (archives and libraries) understanding and application is diffused or lost. This is unfortunate as significant differences in vocabulary and vastly different frames of reference makes communications with traditional computing and AV vendors challenging under the best of circumstances.

The computing representative that was selling to the accounting department one day, may well be the first point of contact for the computer company's 'new media products'. The customer would certainly have every reason to question the vendor's knowledge in media, collections operations, or awareness of the cultural, political and creative concerns of archives and libraries. The problem is made worse by vertical market products that are part of an incomplete solution. From the customers' point of view, there is good reason to view the 'systems integration sell' as a problem the customer may have to solve, not one that has been solved for them. The customer does have cause to question the vendor's commitment and understanding of their marketplace.

A similar analogy can easily be made with traditional AV manufacturers who are on very foreign turf with databases and collection responsive technologies,

Emerging products are predictable - incompatible systems, strong in their own right, but of questionable utility to archives and libraries. This is not to say that the core technology does not exist. It does.

A key challenge then is how does a library or archive proceed?

#### **MEETING THE CHALLENGE**

The following points are basic considerations in developing a procedural strategy.

##### **POINT 1**

The commitment to this paradigm shift is unequivocal, with investment and infrastructure development proceeding at the highest levels.

##### **POINT 2**

Commercial interest in capitalizing on digitally networked distribution of information and entertainment to mass markets has led to the development of technologies that have great potential for archive and library usage.

##### **POINT 3**

Successful technical implementation requires bringing together the best of both the computing and AV industries.

##### **POINT 4**

The latter collaboration is poor. The gains for manufacturers serving this broad-based market are attractive enough that competition between those who would logically need to partner have instead led to the computing and AV industries trying to overcome each other.

##### **POINT 5**

This competition has led to industry-centric solutions that miss the mark in meeting customer requirements.

## **POINT 6**

The number one commercial target format that drives the performance of the systems is moving image.

## **POINT 7**

Moving image systems are technically the most challenging. Performance and economies realized here will be appreciated many times over by print, still image and sound collections.

## **LIBRARY AND ARCHIVE IMPLICATIONS**

### **Momentum and Pressure**

The inertia behind digital access to information and entertainment is fast making it an undeniable force to contend with. This momentum is not restricted to commercial environments. The library world has already become a silent participant. The US Library of Congress, among others, have mandated digital access as an additional entry point to parts of collections. The L.C. has already accepted millions of dollars in outside contributions as well as commitments for millions more from the Congress. The Federal Government has made it very clear that networked information is a national goal.

With that kind of edict, whether they are proponents or not of this new delivery vehicle, archive and library administrators will find increasing pressure to evaluate the merits of the approach. And the pressure will not be confined to comparisons within the institutional domain. Correlation with commercial endeavours will be inevitable. The comparisons will include not only cost effectiveness, but also the availability of all format types. Consumer (patron) and investor (funding sources) expectations are already being set by the commercial emphasis on moving image capabilities. In the Library of Congress example with corporate, Congressional, and taxpayer Funding, L.C. administration would be hard pressed not to meet these expectations.

### **STRATEGIES**

In judging the merits of digitally distributed information an archive or library administrator can benefit from the commercial investors' experience". The previously listed Points 1-6 will serve as a partial guide.

First, a solid 'business case' must be made that includes the long term stability of moving in this direction. The evidence presented in this paper and supported in innumerable other venues makes it abundantly clear that the commercial and non-commercial investments in digitally networked information have reached critical mass. This is true in both the financial and political senses. The approach is here to stay. An administrator is on solid ground in bringing consideration of these applications to their respective institutional governors.

Second, the manufacturing community has now begun to build technologies that are indeed *a propos* to collection needs. Given the solid commercial commitment to the mass marketplace, archives and libraries need not worry about the fate of an abandoned niche market. They are now part of a much broader cross-industry picture. This considerably strengthens the substantiation of the availability, support and service of these new technologies and delivery systems over time.

Two of the most important challenges in a business case therefore have been met - long term commitment and stability.

On the other hand, in reviewing the logic called for in Point 3 and comparing, it with the illogical response illustrated by Points 4 and 5 we see the emergence of parochialism and counter productivity. At the very moment when all logic called for collaboration and cooperation the response became illogical competition with roots in corporate vertical cultures. The result to date has been non-customer responsive products.

The print and AV worlds are in many ways vertical cultures subject to the same downfalls ascribed to the manufacturers. If there is any one point to be emphasized in this entire article, it is that: *in moving into digital distribution the print and AV communities must work from the very beginning to establish integrated access to print and AV collections. Cultural boundaries must be minimized.*

This is not a subjective choice. Personal tastes have no relevance in the business case. As stated in Points 6 and 7 the driving financial and technical force is focused on moving image materials. That is a simple commercial fact.

Fortunately, as also pointed out, the commercial sector's interest in making system solutions for moving image cost effective, will dramatically benefit the application of those systems to print and other AV materials. Logic would seem to dictate that it is in the best interest of the print and AV worlds to work in concert with each other and that individual needs are taken into account as work proceeds.

As in the earlier mentioned telephone development analogy - a myopically designed information delivery system will by definition be a failure.

The goal must be in creating an enterprise-wide solution. Print and AV content must be distributable with equal and complementary facility.

This goal should head the list as administrators ponder moving in this direction. Likewise it should always be used as a metric with vendors lest the system fail before it begins.

## CONCLUSION.

Archives and libraries need to step back and objectively analyze how they will, and are being, affected by the advent of commercial networked information services and systems. The phenomenon is already entrenched. There is much to be learned and gained through the understanding and application of the commercial experiences.

Debates regarding emphasis and investment on the print or AV worlds are also already moot. Consumer expectations and economically defensible multiformat technologies have gone beyond past unfeasibility arguments.

This state of affairs, however, presents wonderful opportunities for print and AV collections. Among them are:

- \* The real work of addressing the quality of the content provided can now take center stage.
- \* Print and AV collection administrators and personnel will have strong, and legitimate reason to work together for mutual benefit.
- \* The results of that collaboration will significantly improve and enhance the quality of multiformat access.
- \* Documentation of usage and increased access can be used to great effect by all in cost justification and fund raising.

At this time with the impetus provided by commercial investment, all logic points to collaboration and cooperation in implementing integrated networked digital access to print and AV collections. The fiscal and operational values to those collections are not ambiguous.

## REVIEWS

Paul Vernon: *Ethnic and vernacular music, 1898-1960. A resource and guide to recordings.* Discographies no. 62. Westport CT, Greenwood, 1995. 344 p.

This is an important but a premature work. During the period of 78 rpm recordings - roughly, from 1898 to 1960 - record companies issued an extraordinary amount of ethnic and folk music in most parts of the world. To take a concrete example, the first commercial recordings of Tibetan music appeared well before the First World war. Many of these recordings were only intended for sale in the region where they were recorded, they were seldom collected in archives, and are consequently extremely rare today.

In this volume Paul Vernon attempts to present a guide to all the record companies which made 78 rpm recordings. The focus is on Asian and African recordings, but in principle all countries of the world except the United States are covered.

The really valuable part of the book consists of a survey of the activities of European-based international companies such as Odeon, Columbia, Decca and Gramophone ("His Master's Voice"). We learn, for instance, that the Odeon A 192000 series was reserved for Bulgarian ten-inch recordings, while numbers starting at A 239500 were used for Reunion. There is an additional section on Gramophone Co. engineers and their overseas recording sessions. To the uninitiated this may sound trivial, but such details not only help archivists to date recordings and trace their origins, they also help us to reconstruct, in the absence of other sources, a view of the total activities of these companies. Some of this information has been previously published elsewhere, but never on this scale and in such compact form.

Another section surveys the world country by country and attempts to list all record companies which have been active in each country. It is not limited to companies which have issued ethnic music. The listings are oddly haphazard and incomplete. For instance, the section on Finland makes a correct reference to published discographies of Finnish 78 rpm records, but then fails to mention half of the companies listed in these publications. Some countries or regions are listed twice for no good reason (Ethiopia and Abyssinia), some in odd places (Solomon Islands under Mauritius, Leeward Islands under French Polynesia). Although information on many countries is admittedly hard to come by, the author is obviously unaware of the wide range of discographies published in countries such as Sweden, Norway, and Iceland.

A third section lists CD, LP and cassette reissues of historical folk and ethnic recordings. The listings are arranged by label. It provides the reader with a handy overview of the production of labels such as Arhoolie, Harlequin, Rounder, and Minos, but the selection of smaller labels outside UK and the USA is somewhat random.

There is also a lexicon of musical terms found on record labels in a number of languages, a guide to commercial recordings in African languages, and an appendix listing the national anthems of the world - a favourite with many record companies.

Many people will find this book useful, but I wish the author had had the patience to publish only the essential parts now and then wait for response from other researchers and collectors. Now the cost of the volume may deter private collectors from obtaining this volume now, and possibly also from sending in their corrections and additions.

Rainer E. Lotz: Discographie der deutschen Tanzmusik, Band 4. Bonn, Birgit Lotz Verlag, 1995. Pages 839-1113. Price 100 DM.

Manfred Weihermüller: Discographie der deutschen Kleinkunst, Band 3. Bonn, Birgit Lotz Verlag, 1995. Pages 571-847. Price 100 DM.

Rainer E. Lotz, Michael Gunrem & Walter Roller: Discographie der deutschen Sprachaufnahmen, Band 1. Bonn, Birgit Lotz Verlag, 1995. 288p. Price 100 DM.

The three latest volumes in the German national discography series follow the high standard set by the previous volumes. The stated goal of the project is to cover the total production of German 78 rpm records - "the shellac period" - in several distinct series of volumes covering such various fields of music, including dance bands, light vocalists ("Kleinkunst"), and speech recordings. Additional series will concentrate on serious vocal music and ethnic recordings.

The entries in each volume are arranged alphabetically by performer. Each performer's production is then listed chronologically, including recordings made outside Germany. Only 78 rpm releases are given. The documentation is detailed, including matrix numbers, recording dates, composer credits (which are unfortunately excluded from many jazz discographies) and references to films where the song was featured, if relevant. As far as I have been able to determine, the listings are accurate, although specialists will inevitably find some missing details.

The music discographies will be of great value to collectors, archivists and broadcasters interested in German popular music. Many of these recordings were distributed widely outside Germany, and they are fairly common all over Central Europe and in the Scandinavian countries. The only problem for the prospective user is the lack of a direction. Each volume consists of a more or less random selection of performers, apparently those whose discographies were ready for publication at closing time. This may be a better plan than all those jazz discographies which started at the letter A and never got to the end of the alphabet. There is a cumulative index in each volume, and the mode of publication does not in any way diminish the value of the information published, but I would welcome some preliminary plan indicating how the entire project is supposed to look when it is finished - after all, 78 rpm records are no longer being made, and we are dealing with a finite mass of data.

The discography of speech recordings is somewhat different from the other series. Here we are dealing with recordings by actors, authors, politicians and other prominent personalities. The "performers" listed in Volume 1 include Franz Josef I,

Wilhelm II, Tolstoi (he made a recording in German), Tagore, Hindenburg and Ribbentrop. Although some of these recordings were actually released commercially, many were only made for broadcasting or archival purposes. Many of the personalities listed made only one recording, but the discography includes brief biographies and in some cases complete transcriptions of the recorded speeches.

These discographies are published in very limited editions, so anybody interested in German music and culture would do well to obtain them as soon as they appear.

*Pekka Gronow*

Internationaler Biographischer Index der Musik. Komponisten, Dirigenten, Instrumentalisten und Sänger. [Bd.] 1. A L. München u.a.: K. G. Saur 1995. xl, 347 S., 30 x 22 cm., ISBN 3-598-33810-4: DM 596.-- (geb.; für 2 Bände).

Dieses zweibändige Nachschlagewerk (von dem der Verlag nur den ersten Band zur Rezension eingereicht hat) hat eine zweifache Funktion: Zum einen dient es als schnell zu konsultierendes Hilfsmittel für die Musikereinträge in den verschiedenen Biographischen Archiven, die der Verlag K. G. Saur in den letzten zwei Jahrzehnten als Mikrofiche-Publikationen herausgegeben hat. Diese sechs Biographischen Archive sind nach Ländern (Nordamerika; Spanien, Portugal und Iberoamerika; Italien; Frankreich; Großbritannien; Deutschland) angelegt und enthalten ausgewählte Biographien, die aus älteren Nachschlagewerken solchen vornehmlich des 19. Jahrhunderts herauskopiert wurden. Insofern ist der Internationale Biographische Index der Musik der Personenregisterband für die Musikereinträge dieser sechs Biographischen Archive.

Zum anderen dient er aber auch all jenen, die diese Mikrofiches nicht besitzen, aber auf die Originalschriften mit den biographischen Einträgen zurückgreifen können, da diese Quellen ebenfalls zitiert sind.

Wie schon Kurt Dorfmueller in seinem Geleitwort betont, ersetzt dieses Nachschlagewerk keineswegs die modernen Lexika wie den Riemann, The new Grove und die MGG. Aber es beschleunigt die Personenrecherche vor allem bei weniger bedeutenden Namen im Bereich der Musik, weil in ihm eine Menge spezialisierter, oft regional begrenzter Lexika ausgewertet sind.

*Martin Elste*

Uwe Plasger: Wörterbuch zur Musik. Deutsch Französisch. Französisch Deutsch unter Mitwirkung von Jean-Jacques Legrand und Hermann Rudolph. München, New Providence, London, Paris: K.G. Saur 1995. xvi, 289 pp., 22 x 16 cm, ISBN 3-598-11242-4: 168 DM (cloth).

Mit dieser Neuerscheinung legt der Verlag eine Parallelpublikation zu seinem bereits in vierter Auflage vorliegenden Wörterbuch Musik Englisch-Deutsch/Deutsch-Englisch vor. Auf rund 300 Seiten enthält dieser Band mehr als 16.000 Eintragungen und deckt damit weitgehend den musikalischen Wortschatz ab, obwohl nicht immer ein Nachschlagen unter den entsprechenden Einträgen im umfassenden, inzwischen auch als Taschenbuch vorliegenden *Terminorum Musicae Index Septem Linguis Redactus* (Budapest, Kassel u.a. 1/1977) damit überflüssig wird. Im Unterschied zu der strikt alphabetischen Auflistung im *Terminorum* hat das Wörterbuch zur Musik den vor allem hinsichtlich der französischen Sprache unzweifelhaften editorischen Vorzug, die Einträge in Wortfeldern zusammenzufassen. Obwohl die Instrumentenkunde und die technischen Medien nicht ausgespart bleiben, sind in diesen Bereichen einige Lücken und unidiomatische Übersetzungen auszumachen. So fehlen beispielsweise Langspielplatte und disque laser. Und maison de disques als Schallplattenhaus, -label zu übersetzen, ist nicht gerade idiomatisches Deutsch. Da jedoch bei weitem die Meriten des Wörterbuchs überwiegen, ist die Publikation, die ohnehin keine unmittelbare Konkurrenz kennt, zu empfehlen.

*Martin Elste*

Péter Fülöp (ed.): Mahler discography. New York: The Kaplan Foundation 1995. 473 pp., 25 x 17 cm, ISBN 0-525-94018-9: \$ 50,00 (cloth). Distributed by Penguin, USA.

This handsome publication is the revised and enlarged second edition of Péter Fülöp's Mahler discography published back in 1984 in *Studia musicologica* which was heavily based on Jerome F. Weber's first comprehensive Mahler discography published in 1971 as part of his *Discography* series. Since 1984, the amount of Fülöp's work of love has roughly doubled, and it is good to have a monographic publication instead of an article as part of a yearbook. The arrangement is by works (first symphonies, second lieder etc.). After a brief preface, every section on the recordings of one work starts off with a cover illustration or a label illustration of a particularly interesting recording. Each discographic entry has a unique number according to a clever coding system. Each discographic entry contains (ideally) the following: code number, Name of Conductor, Name of Orchestra, Date and Place of Recording, Labels and Record Numbers with their respective Release and Deletion Dates and their Countries of Origin, Author of the Notes; and selected Reviews in leading American and English record magazines. The index sections are by artists (including singers, choirs, and orchestras) and by record labels. The final listing is of timings for each movement in comparative schedules. Almost every recording is listed here.

This discography is truly a masterpiece and an invaluable source of reference for the art of 19th century orchestral music making on records.

*Martin Elste*

## Perugia 1996

The 1996 IASA Conference will be held in the company of IAML in the mediaeval town of Perugia in Central Italy. The main part of the Joint Conference will be from Monday, September 2nd to Friday, September 6th.

The 1996 Conference "The Use of Modern Information Technology in Sound and A-V Archives" will address such questions as:

What will be the effect upon cataloguing rules if the sounds are stored with images of record sleeves and textual information in a computer controlled mass storage system?

What is the copyright situation if sounds are distributed via the Internet and similar data networks?

What legal framework do the A-V archives want for their operations in the next century?

How will the role of a discographer change?

What will the impact be on the task of collection management?

To help members prepare for the various themed open sessions, there are several special sessions, open to all, prior to the main Conference, including a three day meeting of the Cataloguing Rules Project group to continue the work to update the cataloguing rules for audio materials in the light of modern needs. This will begin on Wednesday, August 28th.

The Technical Committee, are to hold two half day tutorials that are intended to help non-technical members of IASA understand the technical principles behind the technical developments facing A-V archives. After attending these sessions, the participants will not have been transformed into "Technicians" but it is hoped that a lot of the mystique attached to the subjects will have been stripped away. The first tutorial will be on Saturday, August 31st and will be about the digitisation of audio - why it is of interest to audio collections, what does it involve, how is it done. The second, on the 1st of September, will examine the various new technologies available and their suitability for the long-term storage of sounds. The implications of the convergence of audio, moving and still image material and of text towards a common carrier will also be discussed.

The 1996 IASA Conference should be a stimulating and thought provoking event. It will not, however, be all work. There will be opportunities to explore Perugia, a beautifully preserved mediaeval city set in the Apennines about 135 km North of Rome. It was a major centre of Renaissance painting and works by Raphael and his teacher, Pietro Perugino, and by Bernardino Pinturicchio are scattered through the cities churches and public buildings. The Palazzo dei Priori is one of the best mediaeval palaces in Italy.



CONTENTS

<b>Editorial</b> <i>Helen P Harrison</i>	<b>1</b>
<b>President's Letter</b> <i>James McCarthy</i>	<b>5</b>
<b>SOUND RECORDING</b>	
<b>Stereo in the 1950's and 1960's : the commercialization of a new medium of sound</b> <i>Michael Gray, Voice of America</i>	<b>6</b>
<b>LEGAL ISSUES</b>	
<b>AV Archives and Deposit Agreements</b> <i>Catherine F Pinion, Project Researcher</i>	<b>12</b>
<b>TECHNICAL</b>	
<b>Technical Appraisal of Tape Collections</b> <i>Steven Smolian, Sound Preservationist</i>	<b>24</b>
<b>Preservation of Audio and Video Materials in Tropical Countries</b> <i>Dietrich Schüller, Phonogrammarchiv, Vienna</i>	<b>35</b>
<b>Survey of Endangered Audio Carriers</b> <i>George Boston</i>	<b>46</b>
<b>ACCESS</b>	
<b>The Value of Integrated Access to Print and AV Collections</b> <i>William Storm</i>	<b>53</b>
<b>REVIEWS</b>	<b>68</b>