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EDITORIAL

Fortunately I have a good memory for places. The photo-processing laboratory at the local branch of a well-known British high street chain has managed to lose the reel of film I took during the IASA Conference in Oman. At first I was given someone else's photographs, coincidentally from another hot and sunny location. Coming across representations of someone else's memory unexpectedly in this way can be quite disturbing, though it might have been intriguing: in this instance it was just annoying.

'Memory' was a recurrent theme at the Conference. (It usually is, of course, since most of us probably see our activities as sound archivists in terms of preserving individual and collective 'memories'). Thus, invoking memory was recommended as an antidote to the over-indulgence of consultants in Dr Michael Harms' keynote speech; Hans Rütimann's report on the work of the Commission on Preservation and Access included the story of how the 1960 census data for the United States was "archived" on an obsolescent medium, prompting the Committee on the Records of Government to exclaim that "the United States is in danger of losing its memory"; there were several references in papers and reports to UNESCO's *Memory of the World* project; from Switzerland we heard about a co-operative initiative between archives and producers called MEMORIAV; from Denmark, the *Vision of the Teletarium - worldwide access to the sound and audiovisual memory*; a variety of memories were re-awoken (along with some other emotions) by Olle Johansson's choice of illustrations for his talk on the *Swedish Classification system for Rock, Jazz, Folk and Popular Music*.... Most strongly of all, 'memory' was presented to us in living form through a series of traditional performances involving Omani dancers, singers and instrumentalists, punctuating the proceedings in a delightful and fascinating manner.

Our host for the Conference was the Oman Centre for Traditional Music and they carried out their conference duties with professionalism and deserved pride. Delegates were clearly impressed during the guided tours and follow-up presentations by the achievements of the Centre and, likewise, of the neighbouring TV and Radiò Archives. These institutions are emblematic of the dynamic outlook which has taken hold of the country since 1970 when the Sultan al-Qaboos came to power. They help to nurture an appropriately balanced attitude to the inevitable encroachment and allure of outside influences while ensuring at the same time the survival of national traditions.

The trademarks of Western commerce which now compete for memories in Oman, as elsewhere - *MacDonalds, Mercedes Benz, Sony, Toyota, IBM*, etc., - are ubiquitous along the new coastal highway from the airport to the Muscat area, their neon

signatures emphasised by the background of silhouetted mountains and deep, clear skies. They seem to defy the sturdy old forts which are the main architectural feature of the Omani coastline and interior, and which might be regarded as metaphors for other forms of guard duty less appropriate to cultural assimilation.

For me, the most fascinating and moving part of the conference's cultural programme was the evening spent along the coast at Sohar where we were given a demonstration of a number of traditional dances and chants, some religious. I felt I was hearing something timeless (clearly ancient) expressed in rhythms, melodies and gestures which stem from the reaction of people to their environment and the 'business' of living. The rarefied refinement of Western equivalents (though some music by Xenakis I have just sung seems a possible throw-back) can cause one to lose sight of these essential origins, but just as I was beginning to sense strong affinities with a performance of *Malid* (singing the praises of Allah) an elderly musician challenged me with the question "*You are British? What for you want all this?*"

Perhaps I read more into his remark than was intended, but I took it to mean two things. Firstly, other British people involved in Oman for several centuries had paid scant attention to the culture of the region. Was I any less indifferent? Secondly, coming from a different cultural background there was no possibility of my reacting to the 'performance' in any way other than I would react to some other exotic museum exhibit - "that's different, how charming; next exhibit, please". Another memory for Mr Clark destined to fragment or alter with re-telling.

I might have captured the whole experience on video and deposited it in an archive where it could be 'migrated' to a new digital mass storage system along with hundreds of other similar slices of frozen time. One could then have considered a third meaning for the musician's question, with suitable re-emphasis - "*What for you want ALL this?*" For the assumption seems to be that everything is equally important in the context of sound archives, particularly when talking about digital mass storage systems: someday somebody will find value in that popular song which hovered outside some national top-100 singles chart in 1996, just as we anticipate there will always be a demand (a 'market'?) for wartime reminiscences. (The Oman TV Archive's selection policy was particularly instructive here: "we select only what is important: everything we do is important, therefore we select everything"). Clearly importance is a relative quality and consequently selection has to figure somewhere in the process otherwise we run headlong into the absurdity of one of Borges's most famous archival paradigms, Funes the Memorious, a young Uruguayan boy who finds his memory sharpened to an extraordinary degree after being thrown from a horse -- "*He could reconstruct all his dreams, all his half-dreams. Two or three times he had reconstructed a whole day: he never hesitated, but each reconstruction had required a whole day*".

Would we find such a facility disturbing; intriguing; or annoying? Ireneo Funes ultimately finds it debilitating, is confined to a darkened room and dies of congestion of the lungs.

In IASA we are constantly reminding ourselves about what our job involves - you will find some more reminders in the contents of this *Journal*. One thing is certain, and that is that sound archivists, as members of that community which safeguards knowledge and information, make a valuable contribution to the process whereby historians (in the broadest sense) are enabled to reconstruct and reinforce coherent 'memories' for their contemporaries from the ruins and fragments of the past. If such fragments consist of complete or near complete inventories of a particular activity, such as broadcasting or audiovisual publishing, then the historian has a better chance of re-creating an accurate as well as a coherent memory. This relentlessly objective filing away 'in darkened rooms' of every sound and image must be preferable to the manipulated alternative as exemplified by the outrageous practices of the Soviet archives under Stalin where it was common to doctor photographs for the sake of presenting an approved version of events - read about this in David King's recently published *The Commissar vanishes: the falsification of photographs and art in Stalin's Russia* (Canongate). But at some time or another the objective archivist must expect that those whose job it is to manage or subsidise such endeavours will ask "What do you want all this for?". A selection and safeguarding policy based on economic rather than political imperatives would be just as damaging to the historical legacy but then congestion can be just as as 'fatal'.

Dr Harms's keynote speech for the Conference boldly tackles this kind of dilemma in terms of making a choice between stagnation and commercialism. Opting for the latter inevitably implies changes to the way we organise the work of sound archives. Dr Harms was not present in Muscat to deliver his speech: that duty fell to his colleague Dr Ulf Scharlau who admitted to making some personal revisions to the English version. Therefore he and I agreed that the best solution for the *Journal* would be to include the original German text and the text as read at the Conference. This is followed by three substantial, state-of-the-art deliberations on aspects of digitisation: the work and recommendations of the American Commission for Preservation and Access; the early experiences of the digital mass storage system in the context of a radio sound archive, Albrecht Häfner's at Südwestfunk; and a persuasive recommendation from Klaus Heinz of AudioFile Musikproduktions, Berlin, to call on external agencies to assist in the process of digital transfer or migration.

No Board Charts this time: story to be resumed in the next issue. Instead we have a lively debate between George Brock-Nannestad and Peter Copeland concerning part of the article about BBC recordings which appeared in the last issue.

In choosing Oman as the venue for its Conference, IASA hoped to attract delegates from new countries. This was the first time IASA had held its conference in an Arabic country and several neighbouring Gulf states sent delegates to complement those from the host nation. For the first time we had delegates from Zimbabwe and Uruguay: for only the second time there were delegates from Kenya and from Catalonia in Spain. The next issue will turn its attention to these new, developing resources and to questions of access, featuring the contributions made by the respective delegates at the Conference together with the Editor's paper on metadata. If you feel you have something of interest to contribute along these lines, please refer to the box below.

**IASA Journal is constantly looking for material to publish:
articles, reviews, reports of meetings or new developments.**

Please send anything which you consider to be of interest to IASA
to the Editor at the address on the front inside cover.

Please send copy on PC floppy disk in ASCII format or Word for Windows
version 2 or version 6 or simply as text in an e-mail.

If this is not possible, then good quality hard copy, **double spaced** will do.
If possible, include abstracts (maximum 250 words each)
in French, German or English.

The final date for copy of the next issue, Number 11,
to be published in May 1998 is
31 April 1998.

Earmark in your diary

Very shortly before the deadline the Secretary-General had the latest
news from Paris:

IASA's annual conference 1998 will be held
Sunday 15 November – Friday 20 November 1998
at the Bibliothèque nationale de France.

PRESIDENT'S LETTER

As I write this letter it is already one month since I returned from the annual conference in Oman and I am just slowly adjusting myself to the dark Swedish autumn.

The week in Muscat was indeed an unforgettable experience. I am certain that all of you who attended the conference agree that it was a success. My only regret is that it was not possible for all IASA members to attend the conference in the Sultanate of Oman.

The professional part of the programme - the sessions and papers - was generally of good quality. One of the highlights for me was the presentation of Audiovisual Archives in the Sultanate of Oman which ended up in a learned, vivid and entertaining lecture on Omani folklore by our host Issam El-Mallah from the Oman Centre for Traditional Music.

One of the reasons for holding the conference in Oman was to be able to establish contact with new colleagues from this part of the world and I was especially pleased to see so many newcomers this year. Among the sixty-three registered participants, there were fifteen from the Arabic countries and two delegates from Africa.

At the Board meeting before the conference we discussed public relations and how to increase media interest in the work of IASA. I am happy to say that we did not have to worry about that at all during this conference. The interest shown by Oman was astonishing. There were fifteen government ministers attending the opening ceremony and the conference was fully covered by the media. We got five minutes on prime time television news with a report from the opening ceremony. The local newspapers carried daily summaries of the conference sessions and many delegates were interviewed on radio and in newspapers during the week. IASA was really a focus of media attention which was an unusual situation for many of us.

The conference was very well organised. The logistics and the social arrangements were outstanding thanks to the very generous support of the Ministry of Information and the professional skill of the Oman Centre for Traditional Music. I would like to express my warmest thanks to all who were involved in the conference organising: Issam El-Mallah and his local team, Anke Leenings and Roswitha Borufka, Deutsches Rundfunkarchiv, who very generously assisted the organisers as the "European base", Dietrich Schüller who acted as liaison between the Board and the local committee and

last but not least the IASA Secretary General Albrecht Häfner who was responsible for the co-ordination of the professional part of the programme.

In my opinion, this conference proved - once again - that IASA has a ground of common interest and an agenda which encourages the Association to hold conferences on its own or together with national and regional branches or with affiliated organisations.

At the opening of the Muscat conference Isabelle Giannattasio kindly extended an invitation from the Bibliothèque Nationale de France to hold our next annual conference in Paris together with AFAS, the French affiliated organisation. The invitation was gratefully accepted and we all look forward to meeting again in Paris in the beginning of November 1998.

Sven Allerstrand

ARTICLES

[Audiovisual Archives on the way to Multimedia - the dilemma
between stagnation and commercialisation]

Dr. Michael Harms, Südwestfunk Baden-Baden, Germany

[original German text: English version as presented during
the IASA Conference by Dr Ulf Scharlau follows]

Meine Damen und Herren,

es wäre eine große Freude und Ehre für mich gewesen, dem Wunsch des Generalsekretärs Albrecht Häfner zu entsprechen und hier in Muscat meinen Vortrag zu halten. Ich bitte um Entschuldigung, daß ich aus persönlichen Gründen der Verpflichtung, die ich eingegangen war, nun nicht nachkommen kann. Glücklicherweise fand sich Dr. Ulf Scharlau bereit, den Text vorzutragen, was für Sie immerhin positiv bedeutet, mit einer weitaus besseren englischen Aussprache als der meinen konfrontiert zu sein.

In einer großen deutschen Tageszeitung war jüngst ein längerer Artikel mit folgender Überschrift zu lesen: "Mit Informationsdiensten sichern Bibliotheken ihr Überleben", Der Autor begann seinen Bericht, indem er von der slowenischen Bibliothekarin Zdravka Pejova und ihren entschlossnen Versuchen berichtete, Unternehmen der Wirtschaft Informationsdienstleistungen anzudienen Sodann schlägt der Autor einen Bogen weit über Osteuropa hinweg, erzählt von der Bücherei in Tomsk, die ihre Stromrechnung beim E-Werk nicht in Rubel, sondern mit Serviceleistungen bezahlt, um dann nach Deutschland hinüber zu schwenken, wo in Köln die Stadtbücherei aus "business information" zusätzliche Einnahmen erzielt, mit denen das Angebot an Kinderbüchern verbessert wird. In Berlin wiederum sind Bibliotheksfachleute aus 17 Ländern zusammengekommen, die ein internationales Netz knüpfen wollen, mit dem mittelständische Unternehmen mit Wirtschaftsinformationen versorgt werden sollen.

Weder der Artikel noch ich erzähle Ihnen, meine Damen und Herren, damit etwas wirklich Neues.

Wir wissen alle, daß die Vermittlung von Informationen an Wirtschaftsunternehmen ein Geschäft sein kann - z.B. für die auf eigene Rechnung arbeitenden Information broker, und daß gerade, wenn man Konzepte zur Informationsversorgung kleiner und mittlerer Unternehmen entwickelt und keine Angst vor Bürokratie hat, man zumindest im Bereich der EU mit Geldern aus gewissen staatlichen Förderprogrammen rechnen kann. In Deutschland hat die Regierung die Entwicklung der Informations- und Dokumentationsstrukturen mit mehreren langjährigen Förderprogrammen in diesem

Sinne unterstützt und sie tut es noch (Info 2000). Allerdings ist klar, um was es dabei geht: Wettbewerbsfähigkeit der Unternehmen stärken, indem man ihnen den Zugang zu internationaler Information eröffnet, und nebenbei auch einen Berufsstand fördern, der damit seinen Lebensunterhalt verdient. Die Ziele sind also rein ökonomischer Natur.

Wenn Bibliotheken um ihr Überleben kämpfen - oder Archive, oder auch Museen - und dabei der Idee folgen, der Wirtschaft Informationsdienstleistungen anzubieten, um mit dem Erlös z.B. Kinderbücher anzuschaffen, die sonst nicht gekauft werden könnten, kann man das Spaß finden, oder man mag die Tatkraft und Tüchtigkeit der Kollegen bewundern; gleichzeitig aber müssen dann auch alle Alarmglocken schrillen. Denn was wir beobachten können, ist die Erosion einer historischen Errungenschaft, die einmal besagte, daß es gesellschaftlichen Reichtum anzusammeln gilt, der dazu dienen soll, das kulturelle Erbe zu bewahren und es noch dem Ärmsten eines Landes für seine Bildung und seine Persönlichkeitsentwicklung zur Verfügung zu stellen. Man könnte die Initiative und die Phantasie jener Bibliothekare, Archivare und Museumsleute als einen notwendigen, pflichtgemäßen Beitrag begreifen - ganz sicher ist es das in Ländern und Gegenden, die noch weit davon entfernt sind, so etwas wie gesellschaftlichen Reichtum erzeugt zu haben. Denen hierzu vielleicht sogar jede Möglichkeit vorenthalten wurde und noch wird. In den reichen Ländern aber kommt es wohl darauf an, mehr zu tun als sich ökonomisch rational und kommerziell effektiv zu verhalten! In diesen Ländern geht es wohl darum, sich schnellstens der eigenen Berufsrolle und der mit ihr verbundenen Philosophie zu vergewissern, die uns darauf hinweisen, daß wir nicht zu Händlern und PR-Managern mutieren dürfen.

Ich habe den Begriff "Philosophie" an dieser Stelle mit Absicht gebraucht, denn er weist ganz nebenbei auf ein Committee der IASA hin, das unter der Leitung von Ray Edmundson ein philosophisch begründetes Regelwerk, einen Kodex erarbeitet, der für das berufliche Verhalten eine Orientierung bieten soll.

Selbstverständlich geht es gerade jetzt, in der Zeit des ökonomischen Primats, um die Entwicklung einer präzisen - präzise, das heißt eben auch ausformulierten und nicht zufälligen - Berufsethik, deren wichtigstes Element das Fähigmachen zum Widerstehen in fachlicher Solidarität ist, z.B. und heute dem Widerstehen gegenüber unberechtigten Einspar-Forderungen. Diese fachliche Solidarität kann nur aus der Berufung auf ein Regelwerk, dem sich die Profession verpflichtet hat, resultieren.

Ich sagte eben: "unberechtigte Einspar-Forderungen". Nicht jede Einspar-Forderung ist von vornherein unberechtigt. Verschwendung von Ressourcen gibt es überall und besonders im öffentlichen Sektor reicher Länder; sie zu minimieren ist bestimmt nicht falsch. Ebenso sehe ich keinen Grund, Aktionen abzulehnen, die geeignet sind, unsere

Mittel zu mehrten, wenn dieses nicht dazu führt, daß wir schließlich nichts anderes mehr tun und darüber gewisse Prinzipien aufgeben und vergessen.

Wir können aber kaum so weit gehen, selbst und allein die Verantwortung für das Fortbestehen unserer Bestände zu übernehmen derart, daß es von unserer ganz persönlichen kaufmännischen Geschicklichkeit abhängt, ob die kommenden Generationen das Musizieren und das Sprechen, also die Kultur der früheren noch kennenlernen dürfen oder nicht. Das jedenfalls ist eben nicht unsere Berufsrolle! Aber nicht einmal die Verlagerung der Verantwortung auf unsere persönliche kaufmännische Geschicklichkeit ist das Kernproblem, mit dem wir uns herumschlagen müssen. Es ist vielmehr eine bestimmte Paradigmenverschiebung, die ungefähr besagt, daß nur noch dasjenige von Wert, also Wert bezahlt zu werden, ist, was der Deckung eines Bedarfs, genauer: einer Nachfrage dient. Die Idee, der folgend verschlankt und gespart wird, lautet: Finde einen, der bereit ist, deine Dienstleistung zu bezahlen, weil er sie dringender braucht als sein Geld. Auch das läßt sich nur mit dem Hinweis kommentieren, daß der Satz zwar eine allgemeine Lebensweisheit ausdrückt, meinetwegen auch ein gültiges ökonomisches Prinzip, aber daß die eben nicht bedarfsgesteuerte Alimentierung bestimmter kultureller Einrichtungen zur Legitimationsbasis der modereren Gesellschaften gehört. Dieses wiederum verbietet es unsallerdings nicht, daran mitzuwirken, z.B. die Einschätzung der Attraktivität und Wichtigkeit unserer Überlieferungen positiv zu beeinflussen, um so die Bereitschaft der Gesellschaften zu vergrößern, Mittel für die Erhaltung der Überlieferung einzusetzen.

Lassen Sie mich ein wenig praktischer werden. Vielen von Ihnen wird es ähnlich ergangen sein: Unter dem Druck sich verknappender Mittel und konfrontiert mit dem Gedankengut jener neuen Kaste, die auf Deutsch "Unternehmensberater" heißt (Consultants), ist es in letzter Zeit immer häufiger vorgekommen, daß Personen in leitender Stellung Wert und Nutzen der in den Archiven aufbewahrten Töne, ja, der Existenz der Archive schlechthin in Frage stellten. Offenbar verbreitete sich irgendwann die Idee, es könne durchaus so etwas wie eine "Aktualität" ohne Vergangenheit, und Sie werden den Blickwinkel mühelos wechseln können: auch ohne Zukunft geben. Also die pure Gegenwart, den Augenblick, der allenfalls über die Strecke eines Tages, also vom Morgenmagazin über das Mittagsmagazin zum Abendmagazin, gedehnt werden muß. Radiokultur als pure Gegenwart. Musizieren und Sprechen ohne Erinnerung und Kenntnis des Vergangenen. Musizieren und Sprechen ohne Voraussicht auf das Kommende. Natürlich werden Sie einen Consultant, der Ihnen eine solche Radiokultur vorschlägt, schnell von der Unsinnigkeit, ja Unmöglichkeit seines Konzeptes überzeugen können, denn welcher Mensch mit Verstand hielte das Sprechen beispielsweise ohne den Zugriff auf ein Gedächtnis für etwas anderes als bewußtloses Plappern, sinnloses Geräuschemachen

... Dieser Consultant wird Ihnen also konzедieren, daß auch für seine Radiokultur das eine oder andere Vorhergegangene nötig sein wird - ein O-Ton vielleicht oder doch wenigstens eine Information beispielsweise von der Existenz eines Michail Gorbatschow, wollte man über das Ende des Kalten Krieges reden. Aber was wird der Consultant sagen? Er wird Ihnen klarmachen, daß es sowohl diese Information als auch den O-Ton "jederzeit am Markt zu kaufen gebe", ebenso wie jegliches Zwitschern lange ausgestorbener Vogelarten (Tierserien sind populäre, also umsatzträchtig und auch von unserem Consultant unterstützt) und die oral history alter Indianerhäuptlinge (Fremde Kulturen, ja, gerne!). Im übrigen verwende man, so der Consultant, aber solches Material extrem selten, weil man eben doch mehr Aktuelles und vor allem neueste Popmusik bringen wolle, obwohl - die alten Hits aus den Sechzigern, sie kämen auch gut an, seien aber wie gesagt "jederzeit am Markt zu kaufen". Im übrigen sei es nicht die Aufgabe, den Markt mit Dingen zu versorgen, "die sich nicht rechnen".

Müssen wir auf dergleichen ernsthaft eingeben? Offenbar ja, denn im Kern sagt unser Consultant folgendes:

1. die Menge des Nötigen, um Radiokultur entstehen zu lassen, ist definierbar, d.h. sie ist vor allem klein;
2. diese kleine, begrenzte Menge erhält sich sozusagen von selbst am Leben, sie ist "im Markt";

und 3. sollte der letzte Satz wider Erwarten nicht zutreffen, soll doch irgendein anderer sehen, ob er mit der Gewährleistung von ein bißchen Überlieferung ein Geschäft machen kann; zur Not müßte sich irgendeine zentrale Institution finden lassen, die das erledigt. An deren Finanzierung muß man sich allerdings nicht beteiligen, die soll diese Institution sich selbst erwirtschaften, was ja kein Problem ist, wenn sie sich "nur schlank genug hält".

Wir wissen hier alle, daß unser Consultant in allen drei Punkten irrt.

Die Menge des Nötigen, um Radiokultur zu schaffen, ist nicht definierbar, ebenso wenig wie die Menge dessen, um überhaupt Kultur zu schaffen. Schon gar nicht ist diese Menge klein. Sie hält sich auch nicht von selbst am Leben, indem sie einfach "im Markt" ist. Es ist immer ein gewisser Teil "im Markt", gewiß, denken Sie nur an die detaillierten Informationen, die beispielsweise über den Archipel Gulag zu Stalins Zeiten, so um 1950, "im Markt" waren. Und Punkt 3, der besagte, die Überlieferung sollen andere für mich sichern? Das ist, als wäre ich bereit, auf mein Gedächtnis zu verzichten, weil ich ja jederzeit andere Leute fragen kann, wie ich heiße.

Vielleicht gelingt es aber, unseren Consultant uns gegenüber ein wenig wohlgesonnener zu machen, indem wir ihm ein paar Beispiele vorführen, wie interessiert andere Menschen an dem sind, was wir in unseren Archiven horten. Wenn er diese Erfahrung zusätzlich noch mit der Hoffnung auf irgendeine Art von kleinem Profit verbinden könnte, wäre viel gewonnen.

An dieser Stelle wird es Zeit, an die neuen Techniken zu erinnern, denen wir einen guten Teil unserer Probleme verdanken, die wir aber auch benutzen können, um unsere Situation zu verbessern.

Eine dieser Techniken ist Real Audio - eine Software, mit der man im Internet Radio hören kann. Es hört sich zwar noch an wie früher die Mittelwelle in einem kleinen Transistorgerät, aber es geht, und demnächst wird ein Verfahren auf den Markt kommen, RealMedia genannt, das fast CD-Qualität ermöglicht. Eine andere Technik ist die Übertragung per ISDN, eine aufgebohrte digitale Telefonübertragung. Deutschland verfügt über ein sehr ausgebautes ISDN-Netz des Noch-Monopolisten Deutsche Telekom. Mit diesem Partner hat der Südwestfunk einen technischen Versuch durchgeführt, bei dem es darum geht, es ISDN-Teilnehmern zu ermöglichen, direkt von einem Archiv-Server dort digital gespeicherte Töne auszuwählen, abzurufen und auf dem heimischen PC zu speichern, sie dort vielleicht zu CDs zu verarbeiten, die mit der Heimstereoanlage abgespielt werden können. Noch ist der große Vorzug dieses Verfahrens, daß der Nutzer in den Besitz von Tönen in CD-Qualität kommt.

Die an diesem Versuch beteiligten Partner verfolgen selbstverständlich jeweils ihre besonderen Interessen. Die Telekom möchte als Netzbetreiber attraktive Inhalte verteilen, um so Telefongebühren zu kassieren. Die Rundfunkanstalt SWF möchte einen neuen Vertriebsweg besetzen, vielleicht, um gewappnet zu sein, wenn durch die Onlinemedien völlig neue Formen des Broadcasting entstehen.

Wir vom Archiv möchten, daß unsere Programmschätze häufiger als heute genutzt werden - und unser Anliegen ist dabei weniger, Geschäfte zu machen, etwa durch Einnahmen zur Deckung der Betriebskosten unseres Archivs beizutragen, sondern für uns steht im Vordergrund, wertvolle Tonaufnahmen auf einem nutzerfreundlichen, bequemen und nicht einmal sehr teuren Weg zu den Interessenten zu bringen. Diese Interessenten stellen wir uns nicht als die Massepublika vor, mit denen es unsere Antennenprogramme zu tun haben, sondern als sehr unterschiedlich zugeschnittene special interest groups, Leute mit Vorkenntnissen über das, was sie in einem Tonarchiv suchen, Vorkenntnisse von der Tiefe, wie sie ein wirklich engagierter Laie hat bis hin zu dem Vorwissen desjenigen, der professionell mit den Tönen umgeht, die er bei uns sucht, also der Journalist und der Wissenschaftler. Wenn wir diesen

Gruppen unsere Produktionen zur Verfügung stellen, erfüllen wir unseren öffentlich-rechtlichen Auftrag und erhöhen unsere gesellschaftliche Akzeptanz. Aber ganz ohne Masse werden wir weder die Telekom noch unsere Geschäftsleitung davon überzeugen können, in den neuen Verbreitungsweg zu investieren. Deshalb wird es in unserem Angebot einige Sparten geben, die auch auf pure Unterhaltsansprüche reagieren, z.B. eine Sparte "Radio Comix", in der Sketche und Blackouts hauptsächlich aus der Gagfactory unseres 3. Hörfunkprogramms angeboten werden, die sich allergrößter Beliebtheit bei Menschen zwischen 15 und 45 erfreuen. Oder auch die Sparte "Populäre Klassik", wo die bekannteren Werke der Musikkultur vertreten sind, die unsere Klangkörper eingespielt haben.

Bei der Gestaltung der Web-Seiten, auf die man gelangt, wenn man unseren Dienst in Anspruch nehmen möchte, ebenso wie bei der Konstruktion der Rechercheinstrumente, mit denen der Nutzer unsere Archivbestände abfragen kann, wie auch bei der Entscheidung, welche Informationsbeiträge wir der einzelnen Aufnahme mitgeben, ist es wichtig, den Gedanken von der Verfügbarmachung von wirklichen Archivschätzen mit allem zum Ausdruck zu bringen. Nur dann entsteht etwas Neues, das uns als Archiv nützen kann. Die Telekom hat mit ihrem vorrangig kommerziellen Interesse unsere SWF-on-demand-Idee mit der Idee eines Musikkaufhauses verbunden und will die Schallplattenindustrie auf die online-Vertriebsschiene setzen. Dabei geht es nun wirklich um ein Massengeschäft, bei dem die Hit-Umsätze zählen. Entsprechend sieht natürlich das Layout aus. Wir mit unserem etwas anderen Interesse müssen nun eine Gratwanderung schaffen, nämlich: die Seriosität eines Tonschätze-Angebotes zu wahren und auf der anderen Seite einen eher kommerziellen Vertriebsrahmen zu akzeptieren, der uns zwar den Transportweg beschert, uns aber der Gefahr aussetzt, daß unsere Inhalte trivialisiert und damit längerfristig entwertet werden.

Die Antwort, ob wir die Gratwanderung wirklich schaffen werden, steht wahrhaftig noch aus. Bis jetzt ist das Programmschätze-Angebot des SWF-Archivs nur ein Pilotversuch mit dem Schwerpunkt, die technische Machbarkeit zu prüfen. Noch habe ich meine Zweifel, ob die übrigen Partner, die an diesem Versuch teilnehmen, das nötige Verständnis für die Anforderungen entwickeln werden, die mit der seriösen Präsentation von Archivbeständen verbunden sind. Ich bin aber sicher, daß wir den Versuch wagen müssen, wollen wir unsere Träger von der Bedeutung dessen, was wir tun, überzeugen. Mittlerweile sind ja auch viele andere dabei, die neuen Informationswege zu nützen, auch solche, die von ihrem Material her so gut wie keine Chance haben, das Vehikel ausschnittweiser Massenattraktivität einzusetzen wie wir Schallarchive. So hat man in Baden-Württemberg damit angefangen, Findbücher staatlicher Aktenarchive ins Internet zu stellen. So etwas ist durchaus ein Stück Öffentlichkeitsarbeit und eine Erleichterung des Zugangs zu den Aktenarchiven,

allerdings nur für sehr sehr wenige professionelle Nutzer. In den Schallarchiven haben wir aber die Möglichkeit, nicht nur den Nachweis, sondern den Ton selber auf dem neuen Weg an den Empfänger zu bringen. Wir müssen nur dafür sorgen, daß uns auch bei diesem Vorhaben eine Philosophie leitet, die uns davor bewahrt, archivische Prinzipien der Bestandsbildung, Bestandspräsentation und Bestandsbewahrung zugunsten der schnellen Umwandlung unserer Sammlungen in umsatzträchtiges Repertoire aufzugeben.

Wir werden dem Consultant, von dem vorhin die Rede war, oder besser: seinem zu kurz greifenden Denken, Widerstand entgegensetzen müssen.

Deshalb, liebe Kollegen, lassen Sie uns zwei Dinge tun, die unsere Gratwanderung kennzeichnen:

1. erarbeiten wir, hier in Muscat beginnend, eine Resolution, mit der wir, eine internationale Gemeinschaft von Fachleuten, auf die Bedrohung der Überlieferung durch die neuen ökonomischen Paradigmen hinweisen und

2. dennoch und trotz allem: Let's go to the market. Zeigen wir es ihnen.

(Ich bin sicher, lieber Ulf, du hast den ganzen Optimismus der letzten Zeile übergebracht, besonders die typische kleine Geste mit der Hand, die zu den letzten vier Wörtern gehört.)

Ich danke Ihnen für Ihre Geduld.

Audiovisual Archives on the way to Multimedia - the dilemma between stagnation and commercialisation

*Dr. Michael Harms, Südwestfunk Baden-Baden, Germany
as presented in English by Dr Ulf Scharlau as the Keynote Speech, IASA
Conference, Muscat, Sultanate of Oman, 1997*

Ladies and Gentlemen,

It would have been a great pleasure and honour to fulfil the desire of IASA's Secretary-General who asked me early this year to give the keynote speech at the Muscat conference, passing to me the topic of the alarming dilemma between stagnation and commercialisation the audiovisual archives today are faced with on their way to multimedia. But for personal reasons I am not able to fulfil that request and have to send my apologies. Fortunately, I have found Ulf Scharlau willing and ready to read my paper, which means that you will enjoy a substantially better English pronunciation than mine.

In a major German newspaper you could recently read an article with the title *Libraries survive by providing information services*. The author started reporting on the Slovenian librarian Zdravka Pejova and her resolute attempts to offer information services to her country's economic business. Then he goes the long way round over to East Europe and talks about the library in Tomsk which pays the electricity bill not in roubles but with services. Further he swings back to Germany where the library of the Cologne Council earns additional income by 'business information' which is used to enlarge the stock of children books. The article is completed by a report from Berlin where library experts from seventeen countries met in order to discuss the formation of an international network which could serve for the provision of economic information for the medium-sized business.

This article does not tell you, Ladies and Gentlemen, anything really new. We all know that the provision of information to the economic sector can be a good deal, for instance for the information brokers who work on their own account. We know that, at least in the sphere of the European Community, concepts developed for the provision of information of small and medium-sized enterprises may be supported with government money as long as people are not afraid of bureaucracy. The German government has supported the development of information and documentation structures with several long-standing development programmes (e.g. project Info 2000). The goal, however, is quite clear: to strengthen the competitiveness of business and industry by making available to them access to international information and, in passing, to support a professional group which earns its living dealing with information. Hence, the aims are purely economic.

If libraries - or archives, or even museums - struggling to survive pursue the idea of offering information services to Industry in order to buy children's books which otherwise could not be bought, then you may find that funny or admire the energy and efficiency of those colleagues. But simultaneously, all our alarm bells should ring, since we can observe the erosion of an historical achievement once meaning the collection of social wealth useful for preserving the cultural heritage and yet to make it available for the poorest in the country for their education and personal development. You can understand the initiative and the fantasy of these librarians, archivists and curators as a necessary and dutiful contribution - and surely this is the case in countries and areas which are far from creating anything like social wealth; which have been and are still kept from those possibilities. But in the rich countries it is, quite obviously, the important thing to achieve more than to act economically rational and commercially effective. In the rich countries it is the important thing to make sure as fast as possible of their own profession's role and the philosophy linked with it, which shows us that we must not mutate to merchants and public relations managers.

I am using here the word 'philosophy' deliberately, because it points to a work of IASA to be completed under the chairmanship of Ray Edmondson, the *Philosophy of AV Archiving*, which can be seen as philosophically-based standardised rules or a codex offering orientation for the professional behaviour of AV archivists.

There is no question that we need just now, in times of the economic primacy, the development of professional ethics as precise as possible (precise in the sense of a properly formulated and not an accidental definition). The most important element of these ethics is to make an archivist able to resist, for instance, against unjustified saving constraints in professional solidarity. This professional solidarity must be the result of standard rules to which the profession is obligated.

I have just mentioned "unjustified saving constraints". Not every saving pressure is unjustified from the beginning. There are wastes of resources everywhere, especially in the public areas of rich countries. It is, no doubt, correct to minimise them, just as there is no reason to refuse actions which are suitable to increase our resources, provided this does not finally result in doing nothing else than to reflect on how to increase resources and forgetting and giving up certain principles.

But we must avoid as far as possible that only we ourselves take over the responsibility for the continued existence of our collections so much that it depends upon our personal economic skill whether or not the coming generations are allowed to get to know how to play music or to speak which is nothing else than the culture of the past. This is just not our professional role! But not even the transfer of the responsibility onto our personal economic skills is the core problem we have to

grapple with. It is rather a certain move of paradigms saying more or less that only those things are valuable - valuable in the sense of having only a monetary value - that meet a demand if required. The idea of how to slim and to save reads as follows: find someone who is ready to pay for your service because he needs it more than his money. We can comment on this with the remark that, on the one side, this idea expresses a general worldly wisdom or even a valid economic principle, but on the other side it is the subvention of certain cultural goods, not controlled just by demand, which belong to the legitimisation basis of our modern society. This again should not prohibit us from playing our part in having a positive influence, for instance, on the assessment of the attractiveness and importance of our cultural tradition, thus enlarging the readiness of the society to fund the preservation of just this cultural tradition.

Please allow me to go into more practical details. Many of you will have had the same or similar experience: due to the pressure of budgets running short and confronted with the ideas of that new caste which is called 'consultants', it has happened more and more widely that the value and practical use of the archive stocks, even the existence of the archives per se, are jeopardised by the management. Apparently, sometimes the idea has been spread that there could be something like current events without past and, if you turn your point of view to the opposite side, also without future. For a broadcasting company this means to report on the pure present, the sheer moment which perhaps might be extended from the morning across the lunchtime to the evening magazine programmes. It means radio culture as the sole present, to make music and to speak without any recollection and knowledge of the past, to make music and to speak without any foresight of the future. You will, of course, be able very quickly to convince this consultant, when he proposes such a radio culture to you, of the nonsense and the impossibility of his concept. Which human being, after all, having common sense would consider speaking without access to the memory for more than unconscious babble and meaningless noise? This consultant will concede to you then, that he will need for his radio culture one or the other piece of the past - an original sound, perhaps, or at least information on Michail Gorbachev, for instance, for a report on the end of the Cold War. Additionally, the consultant will try to explain to you that both the information and the original sound can be bought on the market anytime, just like all kinds of chirping of now extinct birds and the oral history of old Indian chiefs (serials with animals and strange cultures are very popular and, therefore, might increase sales; hence, our consultant will support them!). Apart from that, our consultant maintains that such materials would be used extremely rarely, because, just after all, more current events and news and more pop music are intended to fill the radio programmes, although the oldies from the sixties, yes, they go down well, but - as the consultant says - they can be bought on the market at anytime. As for the rest, it

would be wrong to supply the market with things having uncertain chances of profit as they evade a real calculation.

That was the consultant so far. Must we respond seriously to his ideas? Apparently yes, as his message claims the following essence:

1. the quantity of what is necessary to let a radio culture come into being is definable, that is, at first, it is small;
2. this small and limited quantity keeps itself alive more or less, because it is on the market;
3. if the last sentence should happen to be incorrect contrary to all expectations, then someone else will surely try to see if he can make this business by making available a little bit of tradition. As a last resort, some central institution should be found which carries out that deal. To take part in the financing of this central institution is, however, not necessary as this institution has to gain the needed means by itself, which is no problem if it only keeps itself "slim enough".

All of us here know that our consultant is wrong on all three issues.

The quantity of ingredients necessary to create a radio culture, just as to create culture generally, is not definable. Least of all, this quantity is not small. Also so it does not keep itself alive by just being in the market. There is always a certain part in the market, sure, remember only, for instance, the detailed information about the Gulag Archipelago which was in the market during Stalin's time about 1950. And what about issue number three saying that others should preserve my tradition? This would just be like my being ready to give up my memory because I can ask other people anytime for my name.

But perhaps we will succeed in turning our consultant into a more well-meaning person by demonstrating to him a couple of examples of how much people are interested in what we stockpile in our archives. If he would combine this experience with the hope of making any kind of a small profit, then it would do a lot of good.

Now is the appropriate time to remind ourselves of the new techniques to which we owe a considerable part of our problems and which could, on the other hand, be used by us to improve our situation.

Let me mention "Real Audio" - a software product which makes radio possible in the internet. It is true, it sounds still like an early medium-wave programme on a transistor

radio, but it works. And a system called "RealMedia" is forthcoming which enables near-CD quality to be received. Another method is the transfer of audio signals via ISDN, a digital telephone transmission technique. Germany is provided with a very well-developed ISDN network which is owned by the still monopolistic German Telecom. Two years ago, my company has, in partnership with German Telecom, carried out an experiment with the aim of enabling ISDN users anywhere to directly select audio titles stored in an archive server within our premises, recall and download them onto a computer hard-disc at home, and further, perhaps, to process them on a CD which can be replayed then with the home stereo equipment. This method has the advantage of offering near-CD quality to the user.

Of course, both the partners involved in this experimental project pursue their particular interests. The German Telecom as the net-operating company wants to distribute attractive contents, thus being able to cash additional telephone fees. The SWF as a broadcasting company wants to open up a new distribution channel, thus being prepared against the time when entirely new forms of broadcasting will come into existence by the online media.

Today, we archivists want our collections, which are our programme assets, to be re-used and exploited more than in the past. Our concern is less to make business and profit, for instance to gain incomes in order to cover the operating costs of our archives, and more to give special emphasis to our goal to forward valuable sound recordings to interested people in a user-friendly, convenient way and at reasonable costs. We believe that these interested people are not the masses who listen to our regular radio programmes but are special interest groups with widely different tastes, people with knowledge and experience of what they look for in our archives, such as the seriously engaged layman or those who deal professionally with sound, for instance the journalist, the scientist or the scholar. If we make our productions available to those groups then we fulfil our public mission and increase our social acceptance.

Without the public, however, we will succeed in convincing neither the telecom business nor our management to make any investment in a new distribution channel. Therefore, we will have a broad offer with some special fields for those who expect a great deal of entertainment. Let me imagine, for instance, a field called *Radio Comix*, where sketches and blackouts are offered mainly from the "gagfactory", one of our magazines which enjoys great popularity with the fifteen to forty-five age group. Or a field called *Popular Classical Music* where the more popular works of the musical repertoire, played by our orchestras, are presented.

It is of utmost importance that the idea of the availability and accessibility of the archive treasures leaves a long-lasting impression, either when designing the WWW

archives. The German Telecom, following commercial interests mainly, has combined our radio-on-demand idea with the imagination of a music supermarket aiming at stimulating the phonographic industry to use online channels for their sales business. This is really the matter of bulk selling where the sales of the hits count most, meaning an adequate layout. We, however, having a differing interest, are faced with a tightrope walk: on the one hand to maintain the seriousness of a public broadcasting company offering its archive treasures. On the other hand, we have to accept a rather commercial sales framework which brings us the suitable transport channel but also exposes us to the danger that our archive contents are trivialised and, as a result, become devaluated.

The response whether we will walk the tightrope successfully is really still open. The SWF archive's offer of programme treasures is only a pilot project so far, focusing on the technical feasibility. And I still have my doubts whether the remaining partners who participate in this pilot project will develop the appreciation necessary for the requirements connected with the serious presentation of archival collections. But I am sure that we must risk it, if we really wish to convince our management of the implications of what we do. In the meantime, also, a great many others are going to use the new information channels, even those who have little or no chance to get any mass appeal such as a sound archive. For instance, in Baden-Wuerttemberg (one of the German Federal States) you can find the catalogues of the governmental record archives on the internet. This is quite a public relations coup and makes access to the archive easier, though for the very few professional users only. From the point of view of a sound archive, it is not sufficient to make available online the reference data only, but also the sound should be transferred to the user via that new channel. We have just to ensure that we will be guided by a philosophy which preserves us from giving up archival principles valid for the building up, the presentation and the preservation of collections in favour of a quick transformation of our holdings into a profitable repertoire.

Let me conclude. All in all, we have to resist our consultant's short-sighted ideas, and he will engage with our opposition. Therefore, dear colleagues, let us do two things, signposting our tightrope walk:

1. let us start here in Muscat developing a resolution which we, as an international community of archive experts, use to point out the threat to the tradition by the new economic paradigms;

and

2. let's go to the market nevertheless! Let's show them how!

The non-profit Commission on Preservation and Access (CPA) and its Task Force on Archiving Digital Information

Remarks by Hans Rütimann, International Program Officer, Commission on Preservation and Access, Washington, D.C..

Presented by Albrecht Häfner during the IASA Conference, Muscat, Sultanate of Oman, 1997

Background

In response to increasing awareness that our printed and documentary record is in jeopardy, the Commission on Preservation and Access was created in 1986. It is an independent organization, funded by U.S. research libraries and private foundations.

Its mission is broad: "to foster and support collaboration among libraries and allied organizations in order to ensure the preservation of the printed and documentary record in all formats and to provide enhanced access to scholarly information."

The Commission -- now affiliated with the Council on Library Resources -- serves chiefly as a catalytic agent, a convenor of interested parties, and an identifier of problems. Initially, its area of activity was book and journal preservation, but it is increasingly active in the issues surrounding electronic formats. The Commission brings groups together to solve problems co-operatively.

Its most important functions are:

- to develop and carry out collaborative plans and procedures that will enable libraries and preservation specialists to expand and integrate preservation work;
- to encourage technical and other research topics of importance to the preservation effort; to shape tools that enable informed decisions;
- to ensure that access to preserved materials is efficient, economical, and supportive of research and scholarship;
- to build and maintain effective communication with key organizations and to promote and encourage institutional adoption of sound preservation policies and best practices.

An active publications program -- monthly newsletter and special reports -- support the Commission's activities and encourage the dissemination of information. The

reports, usually the result of commissioned studies carried out by task forces, indicate the wide range of our concerns:

Preservation Priorities in Latin America (July 1995)

Tape Storage and Handling (June 1995)

A Hybrid Systems Approach to Preservation of Printed Materials (November 1992)

Digital Imaging of Papyri (September 1995)

Digital Image Collections: Issues and Practices (December 1996)

In December 1994, the Commission on Preservation and Access and the Research Libraries Group created the Task Force on Digital Archiving. The purpose of the Task Force was to investigate the means of ensuring “continued access indefinitely into the future of records stored in digital electronic form.” Composed of individuals drawn from industry, museums, archive and libraries, publishers, scholarly societies and government, the Task Force was charged specifically to:

- frame the key problems (organizational, technological, legal, economic, etc.) that need to be resolved for technology refreshing to be considered an acceptable approach to ensuring continuing access to electronic digital records indefinitely into the future;
- define the critical issues that inhibit resolution of each identified problem;
- for each issue, recommend actions to remove the issue from the list;
- consider alternatives to technology refreshing;
- make other generic recommendations as appropriate.

The Commission on Preservation and Access and the Research Libraries Group (RLG) together asked the Task Force to report in effect on ways that society should work with respect to the cultural record it is now creating in digital form.

In taking up its charge, the Task Force on Archiving of Digital Information focused on materials already in digital form and recognized the need to protect against both media deterioration and technological obsolescence. It started from the premise that migration is a broader and richer concept than ‘refreshing’ for identifying the range of options for digital preservation. Migration is a set of organized tasks designed to achieve the periodic transfer of digital materials from one hardware/software configuration to another, or from one generation of computer technology to a subsequent generation. The purpose of migration is to preserve the integrity of digital

objects and to retain the ability for clients to retrieve, display, and otherwise use them in the face of constantly changing technology. The Task Force regards migration as an essential function of digital archives.

The Task Force's final report was published in 1996 -- *Preserving Digital Information; Report of the Task Force on Archiving of Digital Information* (it is available in hard copy from the commission and from the Research Libraries Group in a Web version <URL <http://www/rlg.org>>.

The Task Force noted:

“We are faced with a problem of organizing ourselves over time and as a society to manoeuvre effectively in a digital landscape.”

Don Waters, Co-Chair of the Task Force, said in a speech to the Association of Research Libraries:

“The effort to meet the cultural and economic imperatives of digital preservation requires us to build, almost from scratch, a system of infrastructure from moving the record of knowledge naturally and confidentially into the future. This infrastructure has at least two dimensions: the elements of the system and the manner in which we interact to deploy those elements and construct the systems and subsystems for digital archiving.”

Conclusion

The Task Force recognized that most of the challenges associated with digital preservation are organizational -- not technical. The five key findings were:

- 1) the first line of defence against loss of valuable digital information rests with the creators, providers, and owners of digital information;
- 2) long-term preservation of digital information on a scale adequate for the demands of future research and scholarship will require a deep infrastructure capable of supporting a distributed system of digital archives;
- 3) a sufficient number of trusted organizations must exist that are capable of storing, migrating, and providing access to digital collections;
- 4) a process of certification for digital archives is needed to create an overall climate of trust about the prospect of preserving digital information;

- 5) certified digital archives must have the right and duty to exercise an aggressive rescue function as a fail-safe mechanism for preserving valuable digital information that is in jeopardy of destruction, neglect, or abandonment by its current custodian.

The final report focuses on three essential questions:

- 1) What does digital preservation entail?
- 2) How do we organize ourselves to do it?
- 3) What infrastructure do we need?

1. **What does digital preservation entail?**

Preservation in both the paper and digital areas includes: preserving the context, or the substance of information; preserving the context required to understand and interpret information well into the future; and providing the means to access and use the information. In each of these functions preservation of digital information is analogous to preserving traditional media, but presents new sets of problems.

Numerous examples illustrate the danger of losing valuable cultural memories that may appear in digital form. Consider, for example, the now famous, but often misrepresented, case of the 1960 Census in the U.S.A.

As it compiled the decennial census in the early sixties, the Census Bureau retained records for its own use in what it regarded as “permanent” storage. In 1976, the National Archives identified seven series of aggregated data from the 1960 Census files as having long-term historical value. A large portion of the selected records, however, resided on tapes that the Bureau could read only with a UNIVAC type II-A tape drive. By the mid-seventies, the particular tape drive was long obsolete, and the Census Bureau faced a significant engineering challenge in preserving the data from the UNIVAC type II-A tapes. By 1979, the Bureau had successfully copied onto industry-standard tapes nearly all the data judged then to have long-term value.

Though largely successful in the end, the data rescue effort was a signal event that helped move the Committee on the Records of Government six years later to proclaim that “the United States is in danger of losing its memory.” The

Committee did not bother to describe the actual details of the migration of the 1960 census records. Nor did it analyze the effects on the integrity of the constitutionally-mandated census of the nearly 10,000 (of approximately 1.5 million) records of aggregated data that the rescue effort did not successfully recover. Instead, it chose to register its warning on the dangers of machine obsolescence in apocryphal terms. With more than a little hyperbole, it wrote that

“when the computer tapes containing the raw data from the 1960 federal census came to the attention of NARS [the National Archives and Records Service], there were only two machines in the world capable of reading those tapes: one in Japan and the other already deposited in the Smithsonian as a relic” (1985:9, 86-87).

Preserving content

The first act of preservation in any environment is identifying or selecting materials that merit preservation efforts (selection). The principles and judgements required to predict the future need for information in various disciplines are as complex and varied in their application to digital information as they are to more familiar media. The fluidity and dynamic nature of digital data, however, add some new dimensions. The choice of what version to retain is more difficult since many more versions of a resource are likely to exist. Interactive and dynamic databases, which change from moment to moment, can only be ‘preserved’ through samples or snapshots.

The fluidity of digital information and the ease with which it can be changed introduce the need for authentication of the version that is selected for preservation. A repository of digital information must protect information from tampering and must employ techniques for ensuring users that the information held is actually what it is represented as being. A variety of techniques for protecting and authenticating data exist, but their employment is not yet widespread.

In the short term, any provider of digital information must store the data and provide the systems management and engineering to maintain and deliver it. Longer term retention of files requires additional techniques. Because digital files are dependent on software and hardware to use them, these too must be kept active. Maintaining a museum of unsupported hardware and software platforms is not practical.

The challenges presented by migration illustrate the fundamentally different conceptual bases that distinguish preservation as it applies to digital rather than analog media. Archival preservation via migration requires a commitment to unknown future activities with unpredictable future costs. This essentially requires libraries and archives to change their definition of archival, and their understanding of the commitments and resources necessary to function as a repository.

Preserving context

The issues involved in preserving context are conceptually the same for digital and traditional formats, but it is important to be aware of the new options introduced by characteristics of digital information. The concept of fixity in selecting and maintaining a version of a digital resource is related to understanding its context. How and why has a version been selected, and how does the preserved version relate to those that no longer remain? The provenance of published books can be adequately documented by publications information, but digital resources have no such conventions. Maintaining the 'look and feel' of a digital resource, or at least documenting it for the future, will be increasingly challenging as dynamic documents must be sampled for preservation and as objects migrate to new platforms.

Preserving access

Network discovery and retrieval tools may make cataloguing and indexing of digital resources easier, but it is the responsibility of a digital repository to ensure that access is adequate. A repository must maintain adequate network connectivity; must provide software for retrieving, viewing, and if appropriate, manipulating digital information, must maintain a reliable system for referencing and locating the resources it holds; and must maintain systems for security and integrity and for implementing any restrictions placed on access by the owners of intellectual property. Since these access requirements are not specific to long-term preservation, but are necessary as well for short term use of digital information, there is a large community of publishers and information providers interested in economical techniques for all of these functions. Libraries and archives will not be alone in their efforts to maintain access.

2. **How do we organize ourselves to preserve digital information?**

Because there are so many kinds of individuals and organizations interested in providing access to digital information, the roles of information providers versus those of libraries and other repositories are not clearly defined in the new environment. In the world of material information, the distinction between preservation and use is quite clear. The more an object is used, the more it is subjected to wear and tear: use and preservation are not only different activities, they may be antithetical to each other. On this level, only libraries and archives have become concerned with long-term preservation.

The boundaries between roles in the digital environment are, at present, less clear. Use keeps digital objects alive. If they are in demand, the activities that enable their use -- e.g., access, systems engineering, refreshing -- are the same activities that will ensure their continued functionality. Digital objects that sit unused will become unusable. These blurred boundaries between immediate and long-term use have led many information providers to view themselves as the archival keepers of their data. They see no need for intermediaries, such as libraries and archives, to provide archival functions.

In an ideal environment, content developers, publishers and libraries would work closely together in developing interdependent roles. Those who create digital information would design digital information would design digital resources with access and long-term use in mind, e.g., by providing metadata, using standard formats, documenting software, etc. Those who publish digital information would deposit it with appropriate repositories and develop agreements for long-term preservation and access. We need to strive for this ideal environment. However, there will be cases where digital information has not been created and deposited with such foresight, and libraries and archives will need the legal basis to acquire and aggressively rescue files that have been essentially abandoned by those who created or published them. As we are not only talking about texts and manuscripts: The combined catalog of the members of the Research Libraries Group (RLG) in the United States shows 1.7 million bibliographic references to "sound recordings" in their collections.

3. **What infrastructure do we need?**

One of the major conclusions of the Task Force's report cannot be emphasized enough: *our greatest challenges in the digital age are organizational rather than technical.* Because we currently lack the infrastructure of practices, standards and organizations that are needed to support preservation of digital information, we need to consider the following nine elements of infrastructure:

- 1) Legal bases for deposit rescue. Nationally and internationally, legislation and agreements are needed to encourage legal deposit of electronic resources with archival repositories, to enable rescue of abandoned resources, and to facilitate access and use of files.
- 2) Standards for description. Current library cataloguing standards are not sufficient to describe access and contextual information about digital resources. Several efforts to address this issue are underway internationally. For example, existing registers of microform masters are examined for expansion to include digital items.
- 3) Standards for design and formats. Migration on a broad scale is only feasible if standard formats and platforms are widely used.
- 4) Backward compatibility. Software manufacturers need to be educated and encouraged in the importance of maintaining the usability of older versions of their products (at least for a reasonable length of time).
- 5) Accepted best practices for systems engineering and migration. Information about these techniques is not widely shared across professional communities.
- 6) Enabling technologies. Functions such as migration, emulation, and access can be facilitated by new systems design and technological development focused on these issues.
- 7) Guidelines for archival practices and principles. The expected operational requirements to serve as a responsible repository for digital information are not well understood. Guidelines need to be promulgated, perhaps even through a certification process.
- 8) Processing centers. Many libraries and archives will not have the technical capabilities or specialized expertise to maintain the migrate

digital files, even though they may have the appropriate mission and skills to identify and take responsibility for files to be preserved. In a manner similar to vendors that provide services for microfilm production and storage, processing centers could provide operational services for digital preservation.

- 9) Models for cooperative arrangements. Digital preservation is complex and expensive; it can only be practically undertaken on a distributed basis. Cooperative arrangements will be essential to future use of digital files.

Recommendations by the Task Force for Future Action

The Task Force on the Archiving of Digital Information made recommendations in three areas:

- (1) best practices;
- (2) new models and techniques;
- (3) support structures.

1. Best practices

Although digital resources are relatively new in the long history of communication media, they have been with us for some thirty years, and many have already been preserved. This work has been done in specialized sectors, such as social science data repositories and scientific observatories, and the practices used in each sector have not been shared across disciplines. As libraries and archives begin to face the preservation of digital files created by mass communication and electronic publishing, they can learn from practices elsewhere. The Task Force recommended that the Commission on Preservation and Access commission case studies of successful work in areas such as: design of digital files, mass storage, resource description and migration paths.

2. New models and techniques

The best way to gain experience and learn about new approaches is to encourage and fund pilot projects. The Task Force identified three areas in which funding should be developed to stimulate projects:

- 1) Cooperative efforts to rescue files
- 2) Sponsored digital archives
- 3) Research and development in new technologies

3. **Support structures**

Developing the needed organizational societal infrastructure for digital preservation will require strategic initiatives in several areas. The Task Force recommended that the Commission and RLG develop implementation plans to achieve the following five objectives.

- 1) Make preservation an explicit goal of the U.S. Federal Government National Information Infrastructure initiative.
- 2) Articulate and lobby for the legal principles that will facilitate digital preservation.
- 3) Develop criteria for organizations that wish to serve as digital repositories.
- 4) Educate scholarly societies about the importance of digital preservation and engage them in preserving the information they produce.
- 5) Maintain international coordination.

The issues and strategies identified by the Task Force are not specific to the United States. The challenges of preserving digital resources are large and complex; meeting them will require many approaches and many perspectives.

We will need to share information about best practices and new technologies across a wide spectrum of communities that have not worked together in the past. Digital preservation has emerged as a new, critically important field of interdisciplinary and international activity, and much work is ahead of us.

This is a prime topic for international cooperation. Many in the United States are not convinced that publishers will ever agree to either of the two requirements for digital preservation -- certified archives and a fail-safe mechanism -- that are outlined by the Task Force. If these preconditions are unacceptable, what are the alternatives? Deanna Marcum, President of the Commission on Preservation and Access said that

“As professionals, we must seek common ground with our colleagues abroad and proceed to specify what will be necessary to assure access to our cultural and intellectual heritage for as far into the future as possible. Preservation is a role that has been entrusted to us by society. Digital technology makes it possible to provide

new and exciting methods of access to information, but in the process we cannot abdicate our responsibility for preservation”.

Next Steps: The National Digital Library Federation (NDLF)

The NDLF was organized in May 1995 as a charter organization of fifteen research institutions and the Commission (including the Library of Congress and the National Archives). The goal of the NDLF is to build on some of the recommendations of the Task Force on the Archiving of Digital Information, to advance coherent and enduring access to physically distributed sources of digital information supporting teaching, learning, and research.

The first phase of planning ended on 1 June 1996, with a final report from the NDLF Planning Task Force. The report concluded that a national digital library will be feasible only if it is founded on the principles of Federation, which will ensure that digital technologies employed are affordable and appropriate to the needs of the higher education community. Task Force members established working groups to consider the key technical, financial, and organizational issues in forming a digital library and discussed how the Federation could help in its creation.

Present NDFL Status

With regard to effective governance, NDLF cast its objectives in three areas:

- finance
- program
- participation

A Policy Committee created a dues and capital investment structure which has been in operation since the autumn of 1996. Two ad hoc subcommittees came into being for the purpose of recruiting a permanent Program Director for NDLF and to explore and recommend alternative forms of participation in the Federation, including an expansion of the number and kind of participants. These subcommittees will submit their recommendations shortly and, therefore, will form part of the Federation's objectives in the next year.

With regard to the goals of discovery and retrieval, rights management, economic modelling, and the preservation and archiving of digital information, NDLF has underwritten or endorsed four testbed projects:

- The Making of America, Part II (MOAII)
- The Advanced Papyrological Information System (APIS)
- The Social Sciences Digital Library Consortium (SSDLC); and
- The Berkeley/Columbia Digital Scriptorium

As with the NDLF itself, these testbed projects are works-in-progress. NDLF has plans to seek grant support from the National Endowment for the Humanities for innovative and enhancing discovery and retrieval tools for materials important to research, teaching, and learning in American history during the period 1876-1900. NDLF will also seek additional funding over the course of the year for further developments in MOAII's open architecture, for conversion of source materials in order to build a cohesive and deep collection of digital materials, and for the preservation and archiving of these materials. Finally, as part of the evaluation of MOAII, NDLF will begin an analysis of reciprocity and equity as it applies to local institutional state-up costs and continuing access across multiple institutions.

Unlike MOAII, the primary purpose of which is instructional and informational and the audience for whom will be university and college students, secondary students, and the general public, APIS and the Digital Scriptorium are projects for research purposes. However, what binds these relatively arcane endeavours to MOAII is the common objective of developing and deploying the same architecture of discovery and retrieval of the information contained in databases distributed among a number of research, instructional, and informational uses to distributed numeric and mixed databases. An objective will be a "proof of concept" analysis of the applicability of the NDLF open architecture to such end uses.

The report on the Archiving of Digital Information and the first tentative steps of the National Digital Library Federation make it very clear that answers to many questions will still have to be found. Institutions and organizations in many parts of the world have begun to address issues raised by the digital era -- a truly global concern. Collaboration on many of the open issues is not only desirable but mandatory and we welcome participation and exchanges in a joint attempt to harness the digital advantages without losing the record of the digital era over the longer term.

Paul Conway of Yale University put it this way in *Preservation in the Digital World* (March 1996):

“Preservation in the digital world challenges librarians and archivists, but not necessarily due to lack of understanding of digital technologies, selection criteria, or appropriate organizational contexts for action. Cooperative strategies adopted from ongoing preservation practice are not all that is needed to address the complexities of the costs of digital technologies. Libraries and archives must do more than simply divide the preservation pie. The national digital libraries that are now under construction should be built under an umbrella of guiding preservation concepts. Additionally new approaches to creating and maintaining digital files cooperatively must be developed. The acceptance of shared responsibility and shared funding commitments will preserve access to what are, in essence, unique electronic collections.”

Conway concludes:

“Will the totality of the national digital library or archives -- whether it is a single entity or many things to many people -- be of such high quality and of such extraordinary value to a university, a state government, or other institution that each participant will make a long-term commitment to help support its preservation? Only if the answer to this question is yes will it be possible to build that library and archive cooperatively.”

The Digital Mass Store in a Radio Sound Archive: First Steps into Practice

Albrecht Häfner, Südwestfunk Baden-Baden. Paper given at the IASA Annual Conference, Sultanate of Oman, 1997

By way of introduction, please allow me a preliminary remark on the job of the archivist. An archivist always has to think in the long term and to look in two directions, retrospectively as well as forward. Retrospectively, the period of time involved depends on the age of the archival material in the collection, which in our case is hardly more than one century old. Looking forward, it is the archivist who is responsible for the preservation of the collection s/he administers, ideally for eternity, realistically for a few centuries. The archivist's job has to be carried out totally independent of the ownership of the original contents of the archive and the purposes for which the collection is used. Today, looking forward requires the archivist to recognize that s/he is not only confronted by common archival problems such as the longevity of sound carriers, but is also going to be faced with audiovisual, even 'multimedia' images, and s/he is well-advised to act immediately rather than later: being compelled only to react always means a reduction in one's freedom of action.

The subject of my paper is a radio sound archive, holding the programme assets of its company and supplying radio programmes with archive material, representing music and spoken word recordings made during more than half a century by the company itself or by the record industry. The importance of these enormous programme assets lies mainly in their value for later re-use and exploitation, but also in their representation of our cultural tradition.

Let me briefly summarise, for the better understanding of my paper, the fundamental tasks any archive has to fulfil: archives acquire, document and preserve material and they make it make available and accessible. These fundamental tasks are also valid, of course, for a radio sound archive with respect to its sound documents.

Let me now recall the essential problems which confront radio sound archives. Neither the acquisition nor the documentation of material causes particular difficulties. Neither does access constitute a critical problem, although it is getting harder and harder. It is the preservation of the collections, an extremely delicate area, which causes the real problems, especially in terms of quality control and safeguarding. Due to the fact that public broadcasting companies have been able to afford the best material and equipment as well as optimal storage conditions in the past, regular quality control has hardly existed. Nevertheless, nowadays we know that by adopting such measures the lifetime of magnetic tapes may be prolonged, but will not prevent them from microchemical decay. We have now come to appreciate that the eternal sound carrier

does not exist, no matter if it is a wax cylinder, a shellac disc, a magnetic tape, a CD or whatever else. Therefore, we have recognized that we must preserve not the carrier but the information on it, and, therefore, we have had to change the emphasis of our archival philosophy *away from the eternal sound carrier towards the eternal audio file*.

Archivists who have not performed quality control measurements regularly in the past are not able to provide any evidence about their collections' present condition. To make up for that omission requires expenditure on a gigantic scale: at my company, for instance, the mechanical, electromagnetic and chemical condition of more than half a million magnetic tapes would have to be examined. For that task I have calculated that I would need twelve additional technicians in order to perform a yearly quality control check for every tenth tape in the archive. In times of general staff reduction, this is an unrealistic aim. But out of that area of neglect was born the idea to look for other ways of providing automated methods of effective quality control and safeguarding.

By the way, I am sure that the fact did not escape your notice that for several years now manufacturers of analogue audio equipment have been starting to reduce their output. In this context, a further gloomy prospect emerges, i.e. how to solve, in the long term, the problem of obsolescent sound carriers and playback equipment. How will we play, let me say in fifty years from now, hundreds of thousands of analogue magnetic tapes without having any working tape recorders? We have to remember that the analogue disc, starting with Emil Berliner's shellac in 1887, has had a lifetime of more than one century; we have to realise that the market lifetime of magnetic tape for sound recording, after fifty years of existence, is approaching its end. We can be sure that the lifetime of modern commercial carriers such as DAT or CD will not be as long as those we have used so far. In other words, are we to copy in future our entire collections manually onto a new generation of carrier as soon as an old storage technology becomes obsolete? What a terrible prospect! Instead, an automated transmigration system is what we need as soon as an old storage technology is displaced by a new one.

Obsolescence was the second immense problem we were faced with which, beyond the preservation problem, urged us to look for ways to prevent the situation from developing into an oppressive nightmare. Again, we recognised that we had to change our conservative archival mentality: I repeat, it is primarily the information and not its carrier we have to preserve.

From the beginning, it was quite clear that a digital solution would be preferred, as the disadvantages of the analogue and the advantages of the digital technology could no

longer be ignored. What we found as an existing solution was the digital mass storage technology, which had been available for about a decade on the market from several manufacturers. Their customers are characterised by the need to store vast quantities of data; insurance companies and banks, for example. Also, other services which create a great many data within a short time before they are processed finally, such as interferometry used in cosmic radio research or earth observation satellite-based remote sensing imagery, etc., make use of digital mass storage technology or 'Digital Instrumentation Recording' as it is called there.

It was of utmost importance for our purposes that such digital mass storage systems offered, among other essentials, self-controlling and self-regenerating facilities. This being the case, we would therefore have found the required equipment for automated quality control and safeguarding. The fact that such digital mass store systems were available was recognised by us already in the early 1990s.

Digital mass storage systems and a first multimedia touch

Today, broadcast editors making use of sound carriers from the archive not only handle the carrier itself but also, obviously, other 'carriers' containing additional information such as CD booklets, CD inlays, the label of a tape housing, LP covers, etc., which are of supplementary value to their work. Therefore future dependence upon a digital mass store system requires that this supplementary information, which may be extensive and of considerable importance for the user, must also be stored together with and supplied simultaneously with the audio file. In other words, we will be dealing not only with processes such as capturing sound documents (capturing here means the transfer of the sound information into the mass store) but also with the need to get familiar with machine-readable texts, scanning of still images and transferring video files. And this is the point, finally, where sound archivists have made their first ground-breaking contact with multimedia, forcing us to start thinking multimedially.

From this point we stepped through a door and it dawned on us that we were facing a new era of archiving and documentation, where careful considerations arose of how the archivist might react to the imminent multimedia. These considerations resulted in the following perceptions:

- we already receive a lot of information only in multimedia and hyper-link formats;
- in future, every production will be digital, meaning that older productions will be converted from their analogue condition to digital;

- in the near future, every production, regardless of medium, can be stored as a binary bit stream in and recalled from a digital mass store;
- in future, the information provided to the user cannot be limited to the supply of documents on one medium only, but rather the user wants to exhaust all the possible and available overlapping sources.
- in future, productions will not be made exclusively for a particular medium - TV, radio or press - but rather, for commercial reasons, they will strive from the beginning to make full use of the most varied media. (In other words, the production will be designed multimedially).
- it is already present-day practice to accompany, or enrich, monomedial services with information from another medium. This kind of supplementation will increase and must, therefore, be considered from scratch for production and, from that, also for archiving and documentation.

As an outcome of these perceptions, it is quite clear that the traditional columnar organisation of a broadcasting archive into the three sectors, radio, TV and text (library and press) has to be consolidated into a centralised structure (Fig. 1) in order to be able to actualise certain techniques with less redundancy and friction loss. Consequently, the staff of a professional archive and documentation department have to give up their traditional monomedial orientation. They will have to be able to navigate in a virtual archive world of databases and files, completely independent from original, 'classic' carrier formats associated with the requested item or on which that item makes its next appearance. This will go hand-in-hand with an enormous learning and training process, the inception of which has not yet been put into effect. The user, on the other hand, may access the information via some classical medium or - more probably - via several media, perhaps in some entirely new multimedia application.

Future possibilities and aspects

Back to the digital mass store in the sound archive. I am convinced that as a consequence of adopting the advantages of digital mass storage systems a radio station will be able, from the archival point of view, to cope with the challenge of the coming development in media policy. Broadcasting will increasingly rely on the permanent and immediate availability of its sound - and in future of its audiovisual - archive material.

Once the digital mass store is filled with a sufficient number of audio files, together with accompanying or supplementary data, and is adapted to the broadcasting operations, then it offers new benefits to its users: instead of the usual manual retrieval assisted by the archive's database, selected titles are immediately available for preview purposes. Thus programme editors can compile their programmes in their offices without walking to the sound archive to ask for the loan of tapes or discs.

Furthermore, the digital mass store has fundamental importance for initiatives such as 'Radio on demand' or any forms of 'Pay-Radio'. Only with the support of the mass store can external enquiries about the transfer of company-owned productions be served without incurring additional staff and equipment costs.

Likewise, in the immediate future the digital mass store will support the direct exchange of audio and other data between remote archives or radio stations as soon as appropriate and cost-effective networks are available.

Finally, the transfer of audio documents into the mass store together with accompanying material, such as printed texts, graphics, still or moving images, means that it becomes used as a multimedia store. This matches precisely, as I have mentioned previously, the requirements of every broadcaster.

Action to be taken

After three years of market research and debating the right solution for the future sound archive, we thought that a pilot project should be set up in close co-operation with a qualified manufacturer to gain experience in how to deal with such facilities. We started this pilot project in January 1996.

Since the pilot project runs in parallel with regular archive operations, it is restricted to a functional mini-model of what is likely to be the eventual installation. Moreover, priority is given to those operations needed to keep the sound archive going. Users, such as our editors and the production or editing studios will, for that reason, not be taking part in the pilot project, but only in its continuation. Nevertheless, the pilot project is not an isolated activity, but will be carried out with the aim of achieving integration of the sound archives with the digital development of our radio station.

The hardware of the pilot project is based upon the client-server concept and consists of the following components (Fig. 2):

- a digital mass store with 2 TeraByte storage capacity (equivalent to about 3000 hours of linear audio) and two drives;
- a server for the management of the mass store, including the working buffer based on hard discs with a cache of 15 GigaByte;
- four capturing clients for data input and output;
- three browsing clients for data retrieval and output;
- a local area network, including a bridge to an existing FDDI network;
- use of the reference data in the existing host data base.

First experiences

A few words on our first and, admittedly, still scant experiences.

The original intention was to begin the pilot project in late 1994. However, we had not taken administrative difficulties into account. It took a whole year for all internal committees and management boards to be convinced that the pilot project was not a technical toy but a strategic, long-term investment which would ensure the competitiveness of our company in the future. An archivist must be able to think in the long term, and we felt obliged to explain to management that the sound archive stock has to be preserved not only for the next ten years but, at least, for the next hundred years.

The official start date finally took place at the end of 1995, the order was placed and the 1st of January 1996 was elected the beginning of the pilot project. Here we encountered our first disillusionment. We believed that we would be able to work immediately with the equipment after it had been delivered, but first of all the software had to be tailored. It took until May 1996 to install the hardware, implement the software and perform the first integration tests.

From the outset it was agreed that a project group consisting of colleagues from the departments involved would administer the pilot project. It was not the first time that a combined, interdisciplinary project had been carried out at Südwestfunk (SWF), but this particular combination of sound archivists, radio technicians and IT specialists had been relatively unusual and it was obvious that we were all entering new ground. Troubles started immediately with questions about who was responsible for mistakes and errors; the supplier or us? Clear-cut answers were not always forthcoming. As a consequence, we were not able to keep to the original timetable. Fortunately no production dates were endangered, but it completely upset the schedule for user

training. By the way, nothing creates more frustration for a person eager to learn than new equipment which does not work.

Furthermore, we had to learn that nothing happens without the support of IT colleagues. We need the database specialist, we need the operating system specialist, we need the network specialist and several more besides; we need them, moreover, not only as individuals but in a team. Teamwork has been of utmost importance; among other things, teamwork means to communicate within the team, to keep all members of the team constantly informed, because each amendment, each correction, each modification, especially of the software, creates nothing other than confusion if not systematically documented.

The development of all software components was performed at the supplier's research laboratories before implementation at our premises. In retrospect, of all the troubles which occurred, I can state that this caused the biggest, not only because we lacked direct communication with the developer but also simply because the system environments at the laboratory and at the archive, for instance the local area network configurations, versions of operating systems, were unlikely to match.. Consequently, following implementation and the start of the integration tests we encountered a large number of errors, none of which had occurred at the developer's laboratory and which gave rise to several misunderstandings. Therefore, we have had to introduce an error report system which, actually, is comparatively slow and awkward and not very efficient. It would, quite obviously, have been much better to have had the integration and operation tests performed by the supplier on the customer's site.

Moreover, a pilot project is not an ordinary sales contract. A pilot project is based upon a minimum of agreements and a maximum of mutual goodwill both from the manufacturer and from the client. This means that the rules of the game are totally different from those used in the normal sales business and need to be borne in mind constantly. A supplier dealing with a pilot project must not expect, for instance, to make big profits; it may even involve making a loss. On the other hand, the supplier may gain a considerable amount of information, knowledge and experience which might otherwise be unobtainable, thereby increasing the supplier's competitiveness. As long as the project partners comply with the rules, everything is fine. If not, one of the partners may be annoyed because s/he feels disadvantaged or cheated. We had to learn the hard way but, fortunately, the only impact was to prolong the duration of the pilot project without any negative consequences.

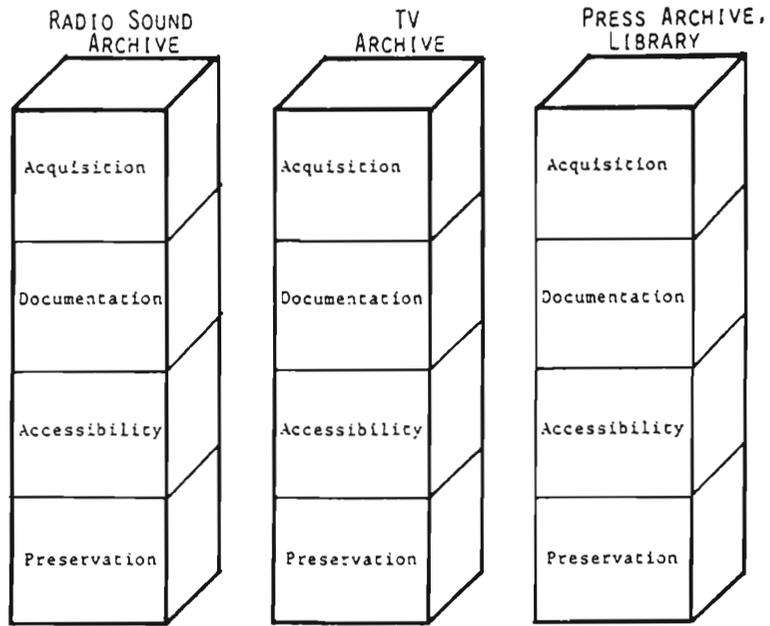
I do not want to give the impression that the difficulties we faced were only of the organisational kind. There were numerous technical difficulties, some of them really hard nuts to crack. One of these surfaced during the past two months and took the

form of sporadic and entirely uncontrolled interruptions during the replay of sounds. It was very difficult and awkward to locate the cause as these breaks could be the result of software bugs or hardware errors anywhere within the server, the clients, the mass store or the network. Eventually we found that the hard disc array of the cache had simply been set at such a low level that it could not serve the volume of access calls. Finally, however, we have obtained full evidence of the feasibility and functionality of the chosen hardware and the software platforms.

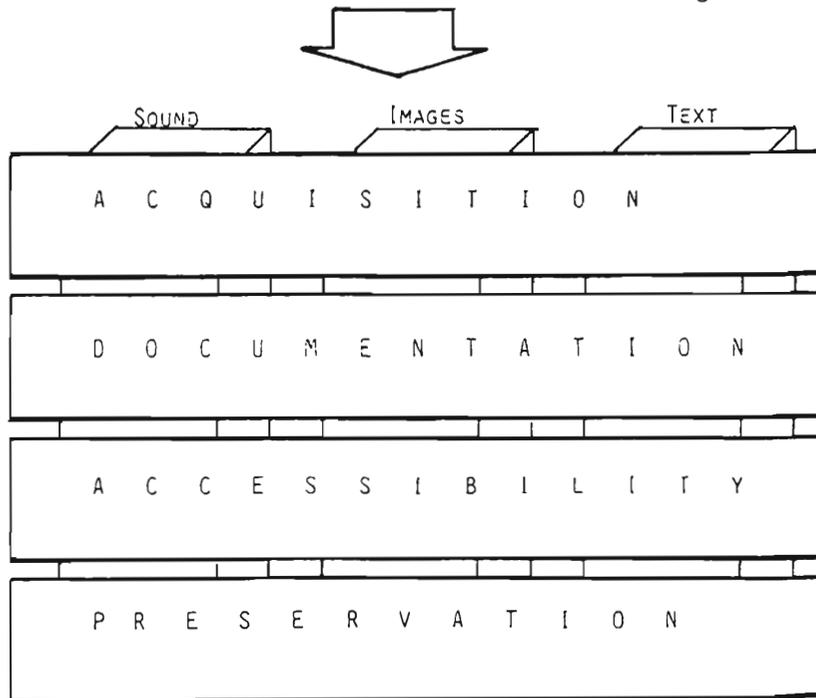
Recommendations

Such recommendations as I can provide are quite obvious:

1. Convince your management of the strategic advantages of the digital mass storage technology.
2. Build up a reliable and co-operative project team for the planning and the realisation. See that the appropriate specialists are represented; make them all swear an oath on teamwork. Make sure the project team has a strong leader.
3. Use all available information on projects already realised; learn by the experience of others.
4. Prepare thoroughly the tender for your project.
5. Choose only those suppliers who are able to provide proof of their experience in this field. It is important that the chosen supplier can deliver both the hardware and the software as their own products.
6. Insist upon installation and implementation of all hardware and software components at your premises and within the system environment you are using.

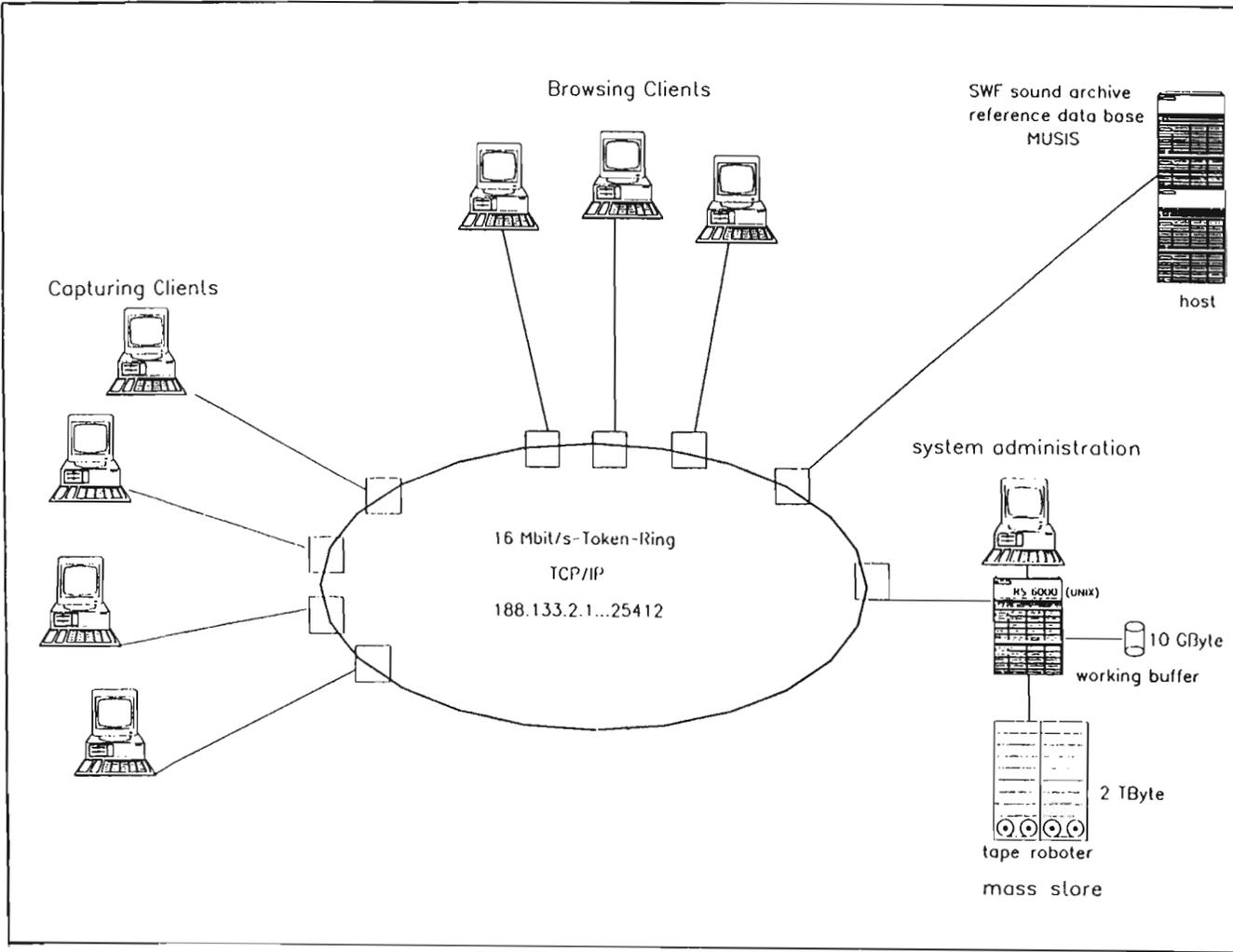


Traditional columnar construction of a broadcasting archive



Future centralized structure of a multimedia archive in a broadcasting company

Fig. 1



Conclusions

As long as the public broadcasting companies treat their archive stocks as their programme assets and continue to make use of them - and this relates to radio as well as to TV - then they are well-advised in the long term to take advantage of the "*Away from the eternal carrier towards the eternal file*" strategy. (You will have noticed that I have suppressed now the monomedial adjective 'audio'). The future of broadcasting will definitely be digital and being aware of the backlog of work for quality control and conservation, we were convinced that it would be unwise to hesitate a moment longer. From the outset we did not believe that there were any substantial advantages in waiting for a better technical solution. On the contrary, we were certain that it was the right time to engage modestly with the digital future.

Digitizing audiovisual archive materials by outsourcing: a first approach

Klaus Heinz, AudioFile Musikproduktions GmbH, Berlin.

*Paper presented at the Open Session of the Radio Sound Archives Committee,
IASA Conference, Sultanate of Oman, 1997.*

abstract

Digitizing the audio heritage for safety and handling reasons is an increasingly urgent task for German broadcast companies, and the quantities involved, together with the demand to slim down organisational resources, have led to the consideration of outsourcing parts of the considerable work that has to be done.

Companies that want to offer a corresponding technical service are confronted with understandable fears concerning the reliable transfer of audio and archival information into the digital domain.

AudioFile has developed a database application that monitors every step of that process, thus maintaining complete control during the generation of the new format. Some ideas about the software are demonstrated and samples from the resulting documentation are shown.

The first two contracts to produce DAT cartridges from various archive materials have been with the Süddeutscher Rundfunk (SDR) in Stuttgart and the Westdeutscher Rundfunk (WDR) in Cologne. Measurements concerning connection activities of the DAT recorder have been carried out and a statistical analysis of these measurements for the first 2.060 SDR DAT cartridges is presented. A resumé is given to estimate the risks as well as the advantages of transferring studio tapes into the DAT format.

The discussion of other formats of interest especially those suited to large storage systems in the Tera Byte (TB) domain conclude the paper.

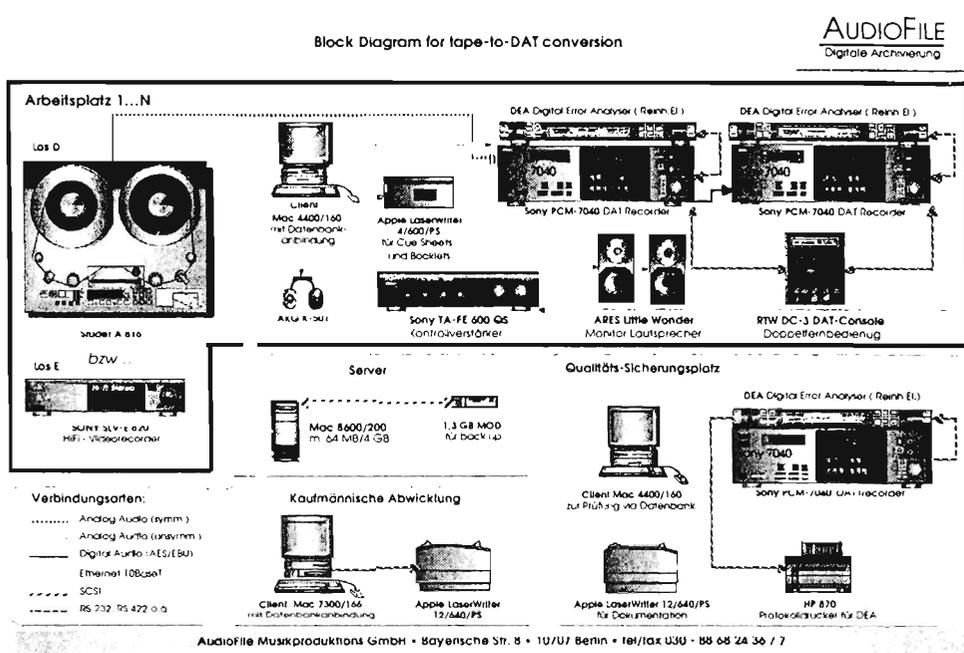
A Archiving studio tapes in the digital format - the data base

To transfer large amounts of studio tapes into the digital domain is a task that contains different aspects. All of them can be combined either to:

- 1: find dedicated operators who use appropriate technical equipment, or;
- 2: prepare to organise thousands of incoming studio tapes, their handling, plus the conversion to the digital domain, i.e. handling thousands of DAT cassettes and transfer of documentation and archive numbers, all error free and effective.

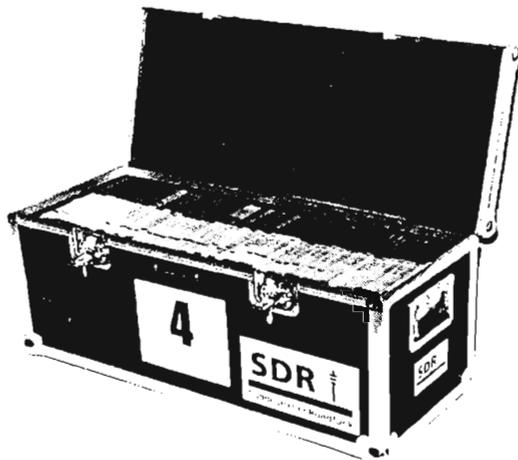
Errors concerning archive numbers lead to perturbations that may become evident only much later, at a time when corresponding DAT is to be used, and there are few chances to correct such errors and find the music originally selected.

Here is a diagram of the machine set-up we used for the task:



Whereas the first group of problems can be handled by typical engineering efforts and usual management care, the second one demands a new approach. The answer is a data base application that handles and controls the various steps during the digitizing process. Some of the guidelines and details of the application developed by AudioFile - the company - are discussed in part A of this paper.

First we have made special studio tape cases, in which the tapes remain during transportation and work flow.



studio tape case

This simple idea proves to be very useful, because it enables us to control the status and location of every tape anytime by documenting the number and location of the cases within the database. For example, the moment the broadcaster needs a tape for transmission we can deliver it to the desktop within a minute.

Organising and controlling all the steps while capturing audio and archive data demands a database application that:

- on the input side takes into account the grown structure of the tape numbers under consideration, (area codes, range and structure of possible numbers);
- controls all input data on a logical basis as far as possible: no duplicate numbers, no missing numbers or details, conditions for numbers to appear and similar considerations;

- automatically generates the archive numbers from the existent analogue tape numbers - very useful to the avoidance of errors at this most critical moment;
- generates barcodes if desired to enable later automatic transfer to large archive systems;
- inputs and validates measured values of error corrections and their location for effective quality control of every DAT cassette to be delivered;
- generates appropriate documentation, such as cue sheets and booklets from the data captured by the operators;
- generates various listings to allow systematic controlling;
- stops work in progress as soon as any data are missing or found to be illogical in one or another way;
- after finishing the DAT, enables a separate quality control to be executed to ensure the correct relation between original music, attached documentation and finished DAT cassette.

To demonstrate the functionality of the software we follow an incoming studio tape on its way to becoming a well documented DAT cassette.

1. Registration

First, every case and every tape entering the company is registered with all the information that is given on the cardboard box. When all tapes have been keyed in, the operator calls for somebody else, and all data are re-read by a different person and controlled on the screen to avoid input data error.

SDR Süddeutscher Rundfunk		Banderfassung		AUDIOFILE Digitale Archivierung	
Kommt als:					
Analogmedium	<input checked="" type="radio"/> Band <input type="radio"/> U-Matic	Komponist	Tschalkowsky, Peter		
Bezeichnung <small>(Verzeichnisnummer des SDR)</small>	E 2152	Titel	Serenade für Streichorchester C-dur op. 48		
Band# kompiliert	E2152	Interpreten	Stuttgarter Kammerorchester Leitung: Karl Münchinger		
Einlieferdatum	21.08.97	Cuesheet Headtext.	Verlag: Rahter, Leipzig		
Id. #	1.168	Markierungsband	<input checked="" type="radio"/> mit <input type="radio"/> ohne		
Stereo	<input type="radio"/> Stereo <input checked="" type="radio"/> Mono	wird digitalisiert als:			
Box #	4	Digitalmedium	<input checked="" type="radio"/> DAT <input type="radio"/> BM Master <input type="radio"/> CDR <input type="radio"/> DLT		
Aufnahmedatum	11.06.49	Archiv#:	<input checked="" type="radio"/> Ja <input type="radio"/> Nein		
Aufnahmeort	Krone		41002152		
Ton	Key		besteht aus 1 Verweise		
Flußdichte	<input type="radio"/> 320 nWb/m <input checked="" type="radio"/> 514 nWb/m		E2152		
Format	<input checked="" type="radio"/> Inear <input type="radio"/> TeleCom cd	zum Cue-sheet			
Banddauer	27:25 m:ss	➔ 			
Bandgeschw.	<input type="radio"/> 19 cm/sec <input checked="" type="radio"/> 38 cm/sec <input type="radio"/> 76 cm/sec <input type="radio"/> andere				

2. Case list

The following list accompanies every case, confirming the tapes that have been delivered and the number of DATs that are to be produced. If more than one tape is compiled to a DAT, this structure is registered here and can be recognised from this point on.

At the same time as the list is prepared, 8-digit archive numbers are allocated automatically by the software, thereby guaranteeing error-free operation at this very crucial point within the process.

Liste eingegangener Bänder:

Id. Nr.	Box	Eint.dat.	Dauer	Band#	Archive	Verweise											
						1	2	3	4	5	6	7					
50	1	31.05.97	21:00	E1377	● Ja ○ Nein	41001377	E1377										12.05.1997
51	1	31.05.97	22:15	E1387	● Ja ○ Nein	41001387	E1387										12.05.1997
52	1	31.05.97	32:00	E1388	● Ja ○ Nein	41001388	E1388										12.05.1997
53	1	31.05.97	29:30	E1397	● Ja ○ Nein	41001397	E1397										17.06.1997
54	1	31.05.97	15:40	E1398	● Ja ○ Nein	41001398	E1398										17.06.1997
55	1	31.05.97	27:50	E1399	● Ja ○ Nein	41001399	E1399										17.06.1997
56	1	31.05.97	75:15	E1403	● Ja ○ Nein	41001403	E1403	E1404	E1405	E1406							17.06.1997
57	1	31.05.97		E1404	○ Ja ● Nein	*	E1404										17.06.1997
58	1	31.05.97		E1405	○ Ja ● Nein	*	E1405										17.06.1997
59	1	31.05.97		E1406	○ Ja ● Nein	*	E1406										17.06.1997
60	1	31.05.97	26:20	E1413	● Ja ○ Nein	41001413	E1413										17.06.1997
61	1	31.05.97	46:00	E1415	● Ja ○ Nein	41001415	E1415	E1416									17.06.1997
62	1	31.05.97		E1416	○ Ja ● Nein	*	E1416										17.06.1997
63	1	31.05.97	17:45	E1417	● Ja ○ Nein	41001417	E1417										17.06.1997
64	1	31.05.97	49:00	E1474	● Ja ○ Nein	41001474	E1474	E1475									17.06.1997
65	1	31.05.97		E1475	○ Ja ● Nein	*	E1475										17.06.1997
66	1	31.05.97	26:10	E1476	● Ja ○ Nein	41001476	E1476										17.06.1997
67	1	31.05.97	31:15	E1477	● Ja ○ Nein	41001477	E1477										17.06.1997
68	1	31.05.97	24:35	E1495	● Ja ○ Nein	41001495	E1495										17.06.1997
69	1	31.05.97	26:45	E1500	● Ja ○ Nein	41001500	E1500										17.06.1997
70	1	31.05.97	24:25	E1523	● Ja ○ Nein	41001523	E1523										17.06.1997
71	1	31.05.97	16:20	E1537	● Ja ○ Nein	41001537	E1537										17.06.1997
72	1	31.05.97	15:00	E1550	● Ja ○ Nein	41001550	E1550										17.06.1997

Dauer Σ 527:05 min = 8:47 h:mm min Bd.# 50 DAT34 Σ 26 DAT94 Σ 2
 Zahl der Bd. = 23 St. ● = 22:55 min:st max Bd.# 72 DAT64 Σ 8 DAT124 Σ 0

Seite 1

3. Barcode labels

To prepare the DAT cassettes for identification and later machine-based transfer into large archive systems, barcode labels representing the archive number are printed for the A and B samples.

The labels are applied the moment the DATs are made ready for recording. The same number goes into the User Bit section of the Sony PCM 7040 DAT machines we have in use. Since 8-digit numbers only are allowed at this stage, the 'Interleave 2 of 5' format is recommended:



4. Cue Sheet - the audio protocol

A detailed cue sheet contains archive data, monitored ID times and durations, left headroom (margin) and cue comments. A number of 'classic' problems like drop-outs, band saturation or audible distortion can be selected from pop-up menus. Thus a future operator, knowing the description and location of the problems, can examine the DAT and decide whether it is still suitable for transmission or not.

In addition, other general comments like "Modulation starts 11 sec. later" can be made in another box, so that the status of the digitized studio tape becomes quite clear.

Various logical tests make sure that no ID time is overlooked or in an illogical range. In the following sample, ID 4 starts before the end of ID 3, and the margin has been forgotten:

Cue Sheet "Kurz"

SDR
Schweizer Rundfunk

Verdi, Giuseppe

Archivnr. **41001863**

Requiem - für 4 Solostimmen, Chor und Orchester

Maria Stader, Sopran - Marga Höfgen, Alt - Fritz Wunderlich, Tenor - Gottlob Frick, Bass

Der Södfunk-Chor und Der Stuttgarter Lehrergesangsverein (Einst.: Herm. Josef Dahmen)

Der Bach-Chor, Stuttgart (Einst.: Erich Ade)

Södfunk-Sinfonie-Orchester

Leitung Hans Möller-Kray

Verlag: Peters

Autonahmedat. 02.11.60

Autonahmeort: Liederhalle
Ton: Pflimmer

Digitale Arch.: Audiofile Berlin
Operator: Brandenburg
Umschrittdat. 18.07.97

Daten Analogband:
 Stereo Mono
 320 nWb/m linear
 514 nWb/m Telecom c4

Medium: DAT 48 kHz
 CD-R 44.1 kHz

Margin

ID Nr.	ID Text	Start ID hh:mm:ss	Mod.ende hh:mm:ss	Zeit/ID hh:mm:ss	Wertzeit hh:mm:ss	Margin p. Wert
1	Requiem	00:59	09:08	08:09	84:07	
2	Dies irae (1. Teil)	09:17	31:44	22:27		
3	Dies irae (2. Teil)	31:44	47:03	15:19		
4	Offertorium	46:11	57:04	10:53		
5	Sanctus	57:22	60:13	02:51		
6	Agnus Dei	60:21	65:44	05:23		
7	Lux aeterna	65:56	72:21	06:25		
Irgendeine ID Zeit falsch.....		Margin fehlt	ID Start vor letztem ID	Ende: eher unmöglich!		

Cue-Kommentare

- Drop outs bei 00:13, 05:49, 06:07, 07:13, 26:11, 27:11, 27:34, 28:58, 29:22
33:26, 37:19, 42:29, 47:51, 53:43, 01:22:58
- Knackgeräusche bei 04:11, 13:22, 24:17, 35:42, 41:07, 42:24, 43:24, 53:56, 01:05:13
- Nutz-Modulationsbeginn ab 01:11

5 Vorratzeit:
 E1863
 E1864
 E1865
 E1866
 E1867

DAT Gesamtzeit: 1:26:06

Wertzeit Summe 1:24:07

5. DEA - The Digital Error Analyser

One of the foremost aspects in the whole process is safety. To ensure the technical quality of the produced DAT cassettes and to meet the specification by the broadcaster it is necessary to monitor and register the control activities of the DAT recorder.

Observed parameters are BLER (Block error Rate) per minute, upper limit 10%; the averaged BLER per measurement period, upper limit 2%; and the maximum error per track with its location, upper limit 25.

Additionally the freedom from averages and mutes is confirmed, consistency and correctness of the Time Code (TC) are indicated.

The behaviour of DAT cassettes can be quite different, as can be seen from the following three protocols:

(HP500) *** DAT-Fehlerprotokoll ***

Betrieb /Anstalt:

Name des Prüfers:

Datum: 02.08.1997

Titel: Drucker 8.

Band Nr.: 41001403

Kassettyp: 124

Rekorder: PCM-7030 Nr.:

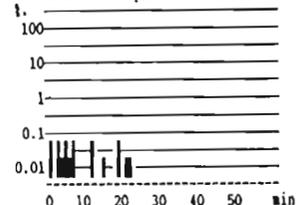
Abtastfrequenz: 48kHz
Gen Timecodeformat: 25F EBU
Tape Timecodeformat: 30F SMPTE NDF
Emphase: Off
Copy Mode: Permit

START-Timecode: 00:00:00:13
STOP-Timecode: 00:21:56:23

Blockfehlerrate KopfA: 0.0214
Blockfehlerrate KopfB: 0.0174
Durchschnitt A/B: 0.0194
Max Error pro Spur: 8

Aves: 0
Mutes: 0
Timecode Fehler: 0

Blockfehlerrate pro Minute :



(HP500) *** DAT-Fehlerprotokoll ***

Betrieb /Anstalt:

Name des Prüfers:

Datum: 05.07.1997

Titel:

Band Nr.: A000E972

Kassettyp: 64

Rekorder: PCM-7030 Nr.:

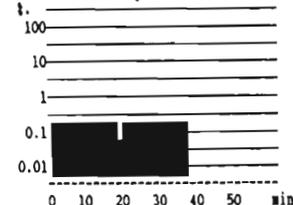
Abtastfrequenz: 48kHz
Gen Timecodeformat: 25F EBU
Tape Timecodeformat: 30F SMPTE NDF
Emphase: Off
Copy Mode: Permit

START-Timecode: 00:00:00:14
STOP-Timecode: 00:36:45:14

Blockfehlerrate KopfA: 0.18 %
Blockfehlerrate KopfB: 0.17 %
Durchschnitt A/B: 0.17 %
Max Error pro Spur: 8

Aves: 0
Mutes: 0
Timecode Fehler: 0

Blockfehlerrate pro Minute :



(HP500) *** DAT-Fehlerprotokoll ***

Betrieb /Anstalt:

Name des Prüfers:

Datum:19

Titel:

Band Nr.: 41002116

Kassettyp: 64

Rekorder: PCM-7030 Nr.:

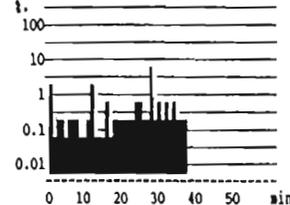
Abtastfrequenz: 48kHz
Gen Timecodeformat: 25F EBU
Tape Timecodeformat: 30F SMPTE NDF
Emphase: Off
Copy Mode: Permit

START-Timecode: 00:00:00:13
STOP-Timecode: 00:37:17:11

Blockfehlerrate KopfA: 0.53 %
Blockfehlerrate KopfB: 0.43 %
Durchschnitt A/B: 0.48 %
Max Error pro Spur: 30

Aves: 28
Mutes: 0
Timecode Fehler: 0

Blockfehlerrate pro Minute :



-----AVERAGE-----		
Anfang	Anzahl	Ende
00:27:55:03	25	00:27:56:02
00:33:30:16	3	00:33:30:17

The results are transferred to the database and compared against the limits. In the following sample, five tapes go into the DAT cassette and have been measured separately. The averages of the single correction activities related to the completed DAT cassette are calculated and used to generate the 'passed' logo if everything is satisfactory.

Eingabe der vom DEA gemessenen Werte:

DAT sample 41001863 -A

Mittelwert	Bl.korr./Min	Location nummer	Max. Fehler /Sp.
0.062	0.140	00:08	8
0.032	0.110	00:16	8
0.034	0.120	00:31	6
0.024	0.130	00:47	7
0.032	0.420	01:05	9

DEA Messungen: OK DATA controlled ✓

Mittelwert: 0.037 Max/Sp: 0.420 Min: 0.020 Loc: 01:05

Ja • Nein

DAT sample 41001863 -B

Mittelwert	Bl.korr./Min	Location nummer	Max. Fehler /Sp.
0.034	0.080	00:07	9
0.045	0.130	00:12	8
0.026	0.100	00:39	8
0.026	0.098	00:57	10
0.036	0.140	01:05	8

DEA Messungen: OK DATA controlled ✓

Mittelwert: 0.032 Max/Sp: 0.140 Min: 0.026 Loc: 01:05

Ja • Nein

Or Kontrolle

zum Booklet →

6. Booklets

DAT booklets in the following format are compiled from the acquired archive descriptions plus the numbers obtained in the cue sheet and the DEA measurements:

1	Sinfonia (Ouverture)	02:11
2	Serenata	03:41
3	3. a) Scherzino. b) Allegro	04:30
4	Tarantella	02:10
5	Toccata	01:23
6	Gavotta con due variazioni	02:19
7	Vivace	01:36
8	3. a) Minuetto. b) Finale	04:40

Strawinsky, Igor **A**

Pulcinella - Suite für kleines Orchester nach G.B. Pergolesi

Das Südfunk Sinfonieorchester
Leitung: Hans Müller-Kray

Verlag: Boosey & Hawkes

Mittelwert: 0.051 Max/Sp: 8 Laufz./Werkzeit: 23:44 / 22:43
Bl.korr./Min: 0.110 Loc: 00:16 Margin: 4 dB Aufn.: 21.06.61

41002107 A
41002107

Strawinsky, Igor

Pulcinella - Suite für kleines Orchester nach

1	Sinfonia (Ouverture)	02:11
2	Serenata	03:41
3	3. a) Scherzino. b) Allegro	04:30
4	Tarantella	02:10
5	Toccata	01:23
6	Gavotta con due variazioni	02:19
7	Vivace	01:36
8	3. a) Minuetto. b) Finale	04:40

Strawinsky, Igor **B**

Pulcinella - Suite für kleines Orchester nach G.B. Pergolesi

Das Südfunk Sinfonieorchester
Leitung: Hans Müller-Kray

Verlag: Boosey & Hawkes

Mittelwert: 0.140 Max/Sp: 19 Laufz./Werkzeit: 23:44 / 22:43
Bl.korr./Min: 0.600 Loc: 30:21 Margin: 4 dB Aufn.: 21.06.61

41002107 B
41002107

Strawinsky, Igor

Pulcinella - Suite für kleines Orchester nach

As every booklet has complete information about the technical quality of the cassette, the long term behaviour of these parameters can be studied easily.

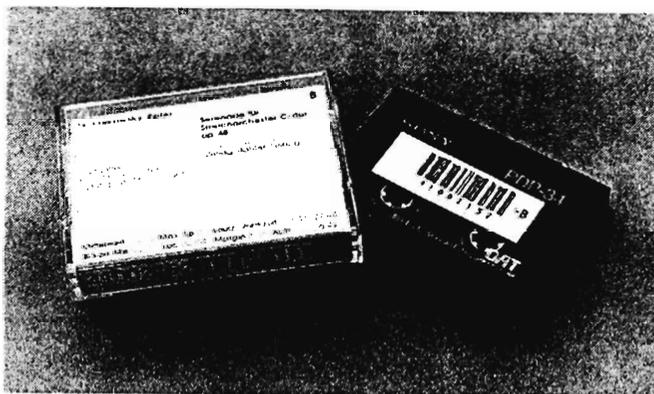
It will be interesting to look at these numbers in a statistical approach in two or three years to confirm whether there are unexpected changes or not and how life expectancy of DAT cassettes may be affected.

7. Final QC (quality control)

Each pair of cassettes is individually controlled for correctness of

- continuous User Bit
- continuous Time Code and
- correct ID settings

The result, after inserting control operator and control date, is the final OK for the cassette to be delivered:



Typical DAT with attached documentation

8. Check list

The moment all tapes within a case are digitized a list is generated which will allow a review of the batch to see, for instance, whether something went wrong with one of the DAT cassettes:

OP Kontrollliste



Kd.#	Box	Einliefer.	Archive#	DAT A			DAT B			#	DAT Lz	Marg.	Umschn.	Operator	Int.						
				DEA		fertig	DEA		fertig												
98	2	31.05.97	41001779	OK	0.100	0.250	10	00:00	✓	OK	0.100	0.750	11	00:01	✓	✓	19:10	6dB	11.07.97	Voigt	
99	2	31.05.97	41001774	OK	0.200	0.500	9	00:14	✓	OK	0.067	0.130	10	00:18	✓	✓	26:06	4dB	11.07.97	Voigt	
100	2	31.05.97	41001760	OK	0.028	0.090	9	00:11	✓	OK	0.056	0.160	9	00:12	✓		20:53	4dB	11.07.97	Voigt	●
101	2	31.05.97	41001758	OK	0.047	0.150	9	00:10	✓	OK	0.140	0.390	10	00:00	✓	✓	18:31	6dB	11.07.97	Voigt	
102	2	31.05.97	41001756	OK	0.096	0.310	10	00:00	✓	OK	0.130	0.230	9	00:01	✓	✓	18:25	5dB	10.07.97	Brandenbu	
103	2	31.05.97	41001754	OK	0.047	0.160	9	00:03	✓	OK	0.150	0.230	10	00:00	✓	✓	30:31	7dB	11.07.97	Voigt	
104	2	31.05.97	41001750	OK	0.091	0.160	10	00:17	✓	OK	0.083	0.190	10	00:02	✓	✓	26:07	10dB	10.07.97	Brandenbu	
105	2	31.05.97	41001749	OK	0.130	0.440	10	00:00	✓	OK	0.170	0.260	9	00:01	✓	✓	20:37	8dB	10.07.97	Brandenbu	
107	2	31.05.97	41001745	OK	0.335	0.480	10	00:01	✓	OK	0.210	0.420	9	00:00	✓	✓	45:44	6dB	10.07.97	Brandenbu	
108	2	31.05.97	41001742	OK	0.180	0.490	10	00:00	✓	OK	0.096	0.230	8	00:17	✓	✓	19:40	6dB	10.07.97	Brandenbu	
109	2	31.05.97	41001741	OK	0.150	0.300	9	00:09	✓	OK	0.076	0.150	10	00:01	✓	✓	26:45	8dB	10.07.97	Brandenbu	
110	2	31.05.97	41001740	OK	0.180	0.350	9	00:13	✓	OK	0.076	0.210	10	00:01	✓	✓	21:06	6dB	10.07.97	Voigt	
111	2	31.05.97	41001719	OK	0.095	0.170	9	00:16	✓	OK	0.190	1.200	12	00:03	✓	✓	27:37	5dB	10.07.97	Brandenbu	
112	2	31.05.97	41001716	OK	0.110	0.220	10	00:02	✓	OK	0.072	0.210	10	00:00	✓	✓	20:49	3dB	10.07.97	Brandenbu	
113	2	31.05.97	41001715	OK	0.035	0.110	9	00:08	✓	OK	0.100	0.190	7	00:11	✓	✓	16:45	6dB	10.07.97	Voigt	
114	2	31.05.97	41001697	OK	0.069	0.230	10	00:03	✓	OK	0.048	0.170	10	00:08	✓	✓	22:13	5dB	10.07.97	Voigt	
115	2	31.05.97	41001688	OK	0.120	0.360	10	00:22	✓	OK	0.100	0.210	10	00:02	✓	✓	23:36	5dB	10.07.97	Voigt	
116	2	31.05.97	41001687	OK	0.490	2.100	19	00:06	✓	OK	0.130	0.880	11	00:01	✓	✓	34:11	1dB	10.07.97	Voigt	
117	2	31.05.97	41001680	OK	0.100	0.340	10	00:20	✓	OK	0.069	0.170	10	00:14	✓	✓	25:27	7dB	09.07.97	Brandenbu	
118	2	31.05.97	41001667	OK	0.071	0.130	9	00:17	✓	OK	0.086	0.250	9	00:17	✓	✓	22:22	5dB	09.07.97	Brandenbu	
119	2	31.05.97	41001635	OK	0.210	0.480	9	00:26	✓	OK	0.140	0.440	9	00:00	✓	✓	27:23	4dB	09.07.97	Brandenbu	
138	2	31.05.97	41001611	OK	0.045	0.210	9	00:15	✓	OK	0.086	0.180	9	00:01	✓	✓	18:17	5dB	08.07.97	Voigt	

DAT Laufzeit Σ = 8:52:14 = 532:14 Zahl der Bd. = 22 St. ● 23:08 ms

DAT number 41001760 for example has a problem, although the measurements are correct. An internal comment asks for a new label, because the old one has been damaged.

When the list is clean, the case is closed and the DAT A samples are sent to the broadcast station. For safety reasons the B samples are sent separately.

9. Delivery note

The detailed delivery notes contain every DAT including its history and duration.

AUDIOFILE
Digitale Archivierung

AUDIOFILE
Musikproduktions GmbH

Bayerische Str. 8
10707 Berlin

AudioFile GmbH • Bayerische Str. 8 • 10707 Berlin

An den SDR

FB Dokumentation u. Archive

zu Hd. Herrn Humbert / Herrn Dr. Scharlau

Neckarstr. 230

70190 Stuttgart

tel 88 68 24 36

fax 88 68 24 37

Lieferschein DAT A Kassetten 5/97 Seite 1

vom 08.07.97

Anlieferung		Verweis Nr.										
Box	Einl.dat.	Band#	Archivnr.	1	2	3	4	5	6	DAT A ok	Dauer	gel.am:
1	31.05.97	E1388	41001388	E1388						✓	0:33:21	08.07.97
1	31.05.97	E1397	41001397	E1397						✓	0:30:37	08.07.97
1	31.05.97	E1398	41001398	E1398						✓	0:16:39	08.07.97
1	31.05.97	E1399	41001399	E1399						✓	0:28:58	08.07.97
1	31.05.97	E1403	41001403	E1403	E1404	E1405	E1406			✓	1:15:48	08.07.97
1	31.05.97	E1413	41001413	E1413						✓	0:27:16	08.07.97
1	31.05.97	E1415	41001415	E1415	E1416					✓	0:46:51	08.07.97
1	31.05.97	E1417	41001417	E1417						✓	0:18:55	08.07.97
Gesamtzahl der DAT Kassetten: 8										DAT A Dauer Summe: 4:38:25 = 278 min		

AudioFile Musikproduktions GmbH • Bayerische Str. 8 • 10707 Berlin
Handelsregister HRB 6311 • AG Charlottenburg • Geschäftsführer: Jörg Brandenburg

Furthermore, the final control status is ensured and correct samples only reach the broadcaster. Invoicing on a correct price per minute basis is achieved.

So, in the end, only DAT cassettes which are guaranteed to be error-free are sent, thus helping to develop the archives of the future.

B Statistics: inspecting the error behaviour of the DAT recorders and cassettes

One of the nice features of databases is that acquired data can be exported and analysed elsewhere to learn more about their statistical behaviour.

If we want to look at the frequency of events or measurement data related to a complete examination of a process or experiment, histograms are the diagrams of choice. Thus you find histograms for most of the parameters of interest.

Analysis of distributed measured values typically is described by a Gaussian distribution, that generally is written.

$$y = e^{-\lambda x^2}$$

The corresponding graph grows on 0 to 1, the defined maximum, and decreases to 0 again. The bigger the coefficient λ , the narrower this so-called bell curve is distributed around its maximum. It is that kind of curve, that describes 'friendly' statistical behaviour, the widely used normal distributions. To have a measure of the degree of deviation the so called Variance is calculated as

$$S^2 = \frac{\sum x^2}{n}$$

More popular and descriptive is the already mentioned standard deviation, that is the average of the individual deviations S of the average of the distribution we look at.

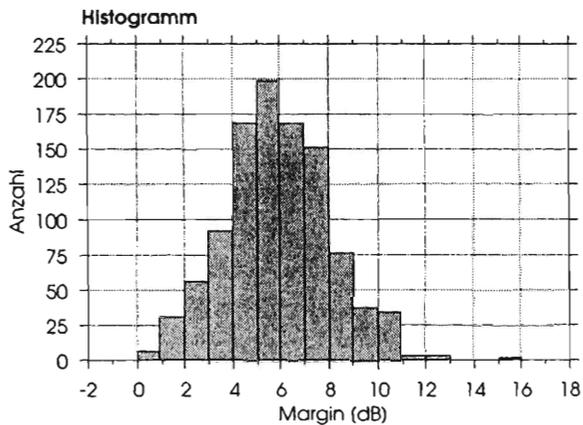
$$\sigma = \sqrt{\frac{\sum x^2}{n}}$$

To give a complete picture of the examined cassettes, we show both diagrams and complete numbers for every parameter we look at.

A total of 2060 DAT Cassettes is the basis of the following statistical report. To give an impression of the technical quality achieved, we look at the behaviour of the following parameters:

1. Margin

Following the guidelines of the ARD [*Arbeitsgemeinschaft der öffentlich-rechtlichen Rundfunkanstalten der Bundesrepublik Deutschland = German Broadcast Corporations*], a 0 dB analogue VU meter value is translated into a -9 dB reading, on the DAT meters. So even the encouraged use of the saturation area of the former studio tape machines should leave some headroom for the digital recording. As you can see in the following histogram, these reserves are much needed, because in seven instances we found 0 dB readings, and in three instances we even had to attenuate the analogue input to get proper results. As we carefully calibrate our Studer A 816's, the question arises how engineers in the late 1950's could achieve such astounding recording levels!



Frequency of Margin (dB)

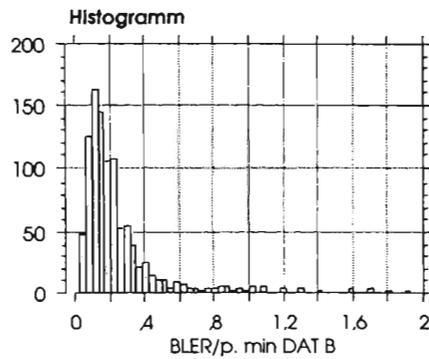
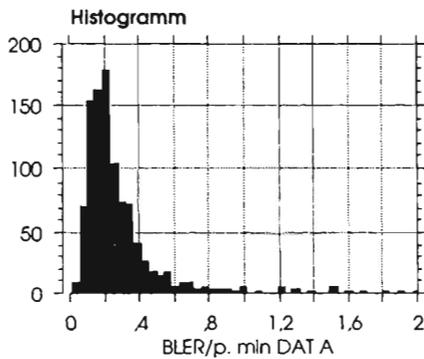
Von (≥)	Bis (<)	Anzahl
0	1.0	7
1.0	2.0	32
2.0	3.0	56
3.0	4.0	92
4.0	5.0	168
5.0	6.0	198
6.0	7.0	169
7.0	8.0	152
8.0	9.0	76
9.0	10.0	38
10.0	11.0	34
11.0	12.0	3
12.0	13.0	3
13.0	14.0	0
14.0	15.0	0
15.0	16.0	2
	Total	1030

2. Error correction

2a BLER (Block Error Rates) per minute

First we take a look at the BLER per minute, that should be less than 10% following the SDR guidelines. As the measured values concentrate around ,2 the upper limit in the graph is set to ,2 only.

The frequency of a total of fifty groups of values is shown in the following histograms:



The exact numbers of these diagram are as follows:

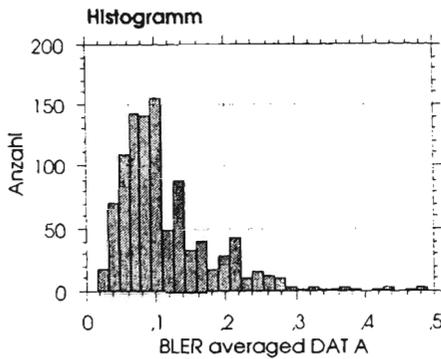
Mittelw. = average value, Std.abw. = standard deviation, Std.fehler = standard error,
Anzahl = population (number of), # fehlend = mission samples

	BLER/p. min DAT A
Mittelw.	,327
Std.abw.	,512
Std.fehler	,016
Anzahl	1030
Minimum	,016
Maximum	8,700
# fehlend	0

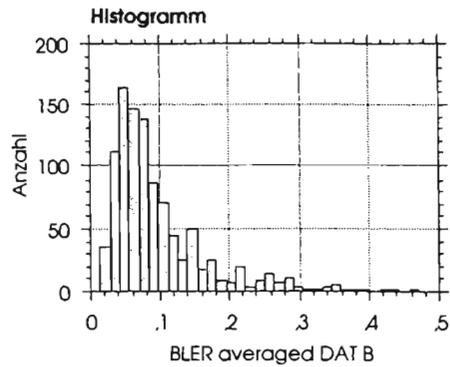
	BLER/p. min DAT B
Mittelw.	,331
Std.abw.	,608
Std.fehler	,019
Anzahl	1030
Minimum	,029
Maximum	7,200
# fehlend	0

2b BLER - averaged values for the measured DAT

The following diagrams for the averaged values for the complete measurement periods show the values on an upper limit of ,5 instead of the permitted ,2 to increase visibility:



	BLER averaged A
Mittelw.	,125
Std.abw.	,118
Std.fehler	,004
Anzahl	1030
Minimum	,015
Maximum	1,600
# fehlend	0

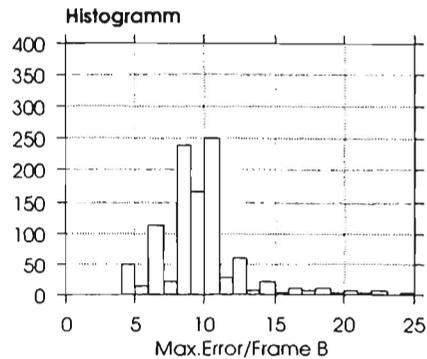
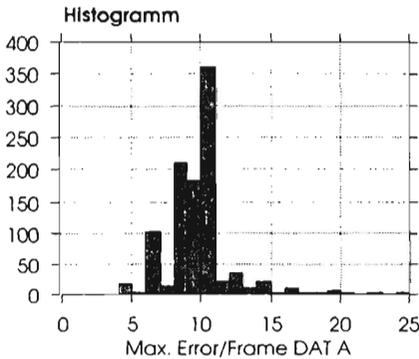


	BLER averaged B
Mittelw.	,104
Std.abw.	,108
Std.fehler	,003
Anzahl	1030
Minimum	,014
Maximum	1,400
# fehlend	0

In both cases error behaviour is shown to be 'friendly', i.e. the distributions are normal in the sense of the Gaussian bell curve. Standard deviation shows both a 'good' behaviour and safely within to the given limits.

2c Maximum error per frame

The number of errors per frame is observed constantly. Their frequency is shown up to the allowed maximum value of 25.



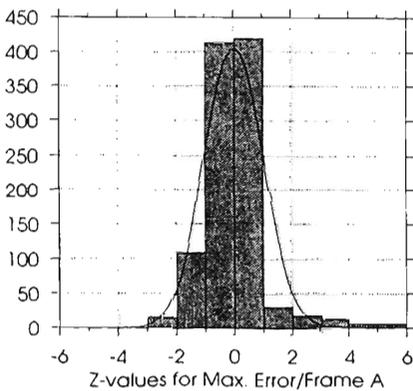
In numbers:

	Max. Error/Frame A
Mittelw.	9,405
Std.abw.	2,638
Std.fehler	,082
Anzahl	1030
Minimum	4,000
Maximum	25,000
# fehlend	0

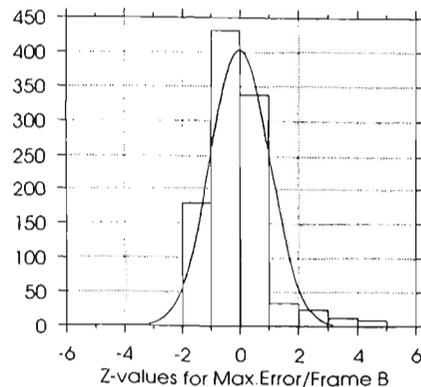
	Max. Error/Frame B
Mittelw.	9,19
Std.abw.	3,07
Std.fehler	,10
Anzahl	1030
Minimum	,00
Maximum	25,00
# fehlend	0

Again we find a good overall picture where the values are well beyond the limits set by the broadcaster. Additional information can be gathered by calculating the z-transformation, that shows the normalised distribution of measurement values around their peak value:

Z-Histogramm
average.: 9,41 - standard deviation.: 2,638

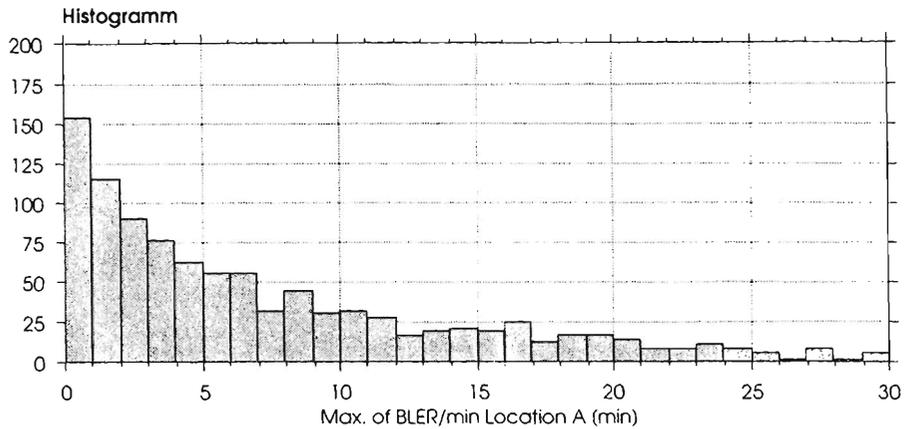


Z-Wert-Histogramm
average.: 9,19 - standard deviation.: 3,073



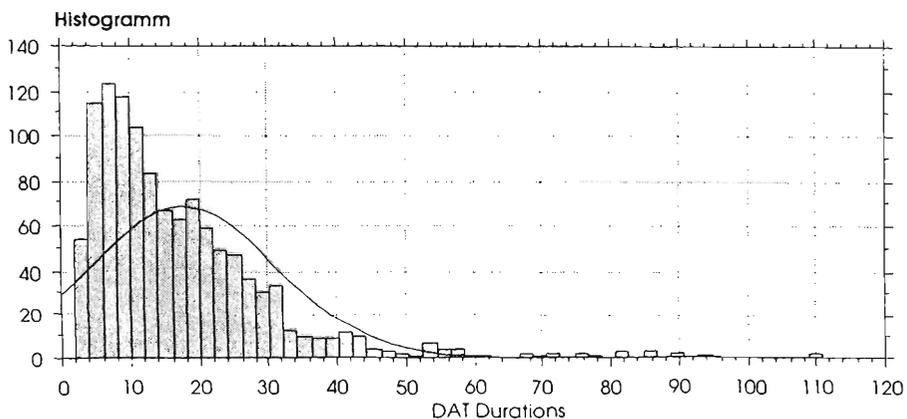
2d Location of the maximum of the BLER per minute

Since it is interesting to know when or where these maxima have occurred, the corresponding locations and their distributions are shown as well:



Evidently most of the BLER maxima occur at early TC values, and it is therefore recommendable to start modulation one or two minutes after the DAT has started. However, to understand the indicated decrease completely it is necessary to know the average modulation times on the cassettes as well. There are less contributing DAT's with higher duration times, and the decrease in the area of more than five minutes is partly due to that number.

The average duration within the 1030 pairs of DAT's has been 17.42 mm:ss, the complete statistic looks as follows:



Summing up it can be stated, that the technical quality of the DAT cassettes delivered is much higher than required by the limits set by the SDR.

Finally it has to be mentioned, that in fifty-two cases DAT's had to be re-recorded due to (forbidden) averages, and that the measured values vary considerably for the same tape, even it is reinserted it into the same machine. Yet the DAT medium *in toto* is very safe as demonstrated by the above statistics.

C The future: Automated tape solutions for multi TB (Tera Byte) archives

The reported tape-to-DAT conversion is only one step on the way to the fully automated digital archive of the future. As there are large capacity storage systems around within the major bank and insurance companies it is useful to look at their approach, because here we have proven figures.

These archives are based on tape solutions in conjunction with automated access within a minute or less to the desired file, and in combination with a hard disk array enable fast and reliable retrieval of files of every kind. Within the next few years such systems will be installed in most of the German broadcast corporations replacing the classic studio tape-oriented archives.

Looking into the future a certain picture emerges which shows that the mass storage systems common in the computer world will play a major role in archives. I do not hesitate to say that this means a change in paradigm for the archivist, because from that moment on it is not a single piece of analogue or digital carrier he has to care about but a computer file and his data migration 'skills'.

As smaller mass storage systems have been available for some time already and have dropped in price considerably they might be considered as a solution for archives holding more than five hundred hours of material. Compared to the now popular CD recording there are tremendous advantages in:

- error-free operation (as there is no real time demand during storage, all digital errors are well below 10^{-15} , practically meaning 0 compared to CD's and DAT's)
- creating 'eternal' audio files by automatically and lossless copying the cartridges every five years, for example.

At the same time, there are some complications in handling:

- you first have to retrieve the selected audio file onto a hard disk to listen to it;
- you have to create a digital carrier - CD or DAT - if you want to play the music elsewhere.

A lot more detailed consideration could be given to mass storage systems, but this is beyond the scope of this paper.

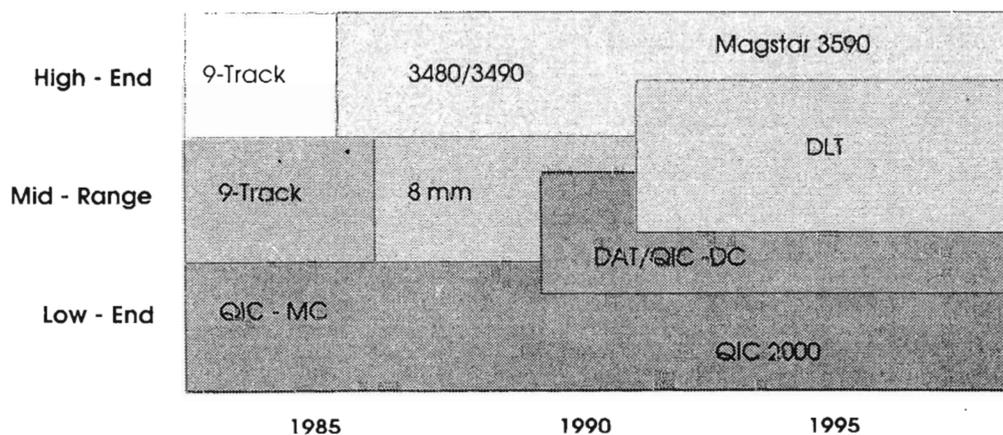
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However, so far a critical mass of audio files has not materialised. As it takes years for every broadcast company to digitize the quantities involved, one cannot wait until the arrival of the big machines. There is little sense in buying large systems that lack the contents they are built for. In order to get around this dilemma the SDR Stuttgart, for example, chose the presently available DAT cassette with incorporated bar codes and user bits as an intermediate storage medium, which can be transferred automatically to the large system, whatever make and size it will eventually be.

A DAT Jukebox that handles the process automatically is under construction, and whoever is interested in the details may contact Dr Matzke from the SDR, who is in charge of the project [tel 0049-711929-2280]. Other solutions for an intermediate format can be imagined as well. Looking at the storage solutions that are common with large computer systems in bigger companies different formats can be found. A short overview can be seen here:



All these different formats can be used to store audio via a back-up software for later retrieval.

It becomes apparent that the back-up software used is of great importance because the later transfer to the 'big box' has to be absolutely precise, and therefore best scalability and proven migration capabilities to later database applications are the main focus here.

These considerations lead AudioFile to offer mainly tape-to-DLT transfers in conjunction with *Legato* software, as a risk-free method of archiving tapes now, without having previously installed one of the major solutions. This software guarantees the possibility, in particular, of transferring files to an IBM ADSM database.

Of course, if there is a final format already known, we can produce these cartridges for direct use within the system.

The safety obtainable here improves the archive situation in a quantum leap. The advantages in reliability and in cost will lead inevitably to the adoption of such systems, and therefore the digitisation of the selected archive contents has to be done - or better: should have been done - the moment the big system was available.

To fill the evident gap between time and manpower is the foremost dedication of AudioFile.

REVIEWS

Carlo Marinelli (ed.). *Materiali per la pubblicazione di una registrazione. Il re Teodoro in Venezia di Giovanni Paisiello*. Quaderni dell'I.R.T.E.M. Roma 1994. 178 pp. With accompanying recording, *Il re Teodoro in Venezia*, IRTEM 993 (2 CD records). Sesto Bruscantini (Teodoro), Florindo Andreolli (Gafforio), Mario Basiola (Acmet), Cecilia Fusco (Lisetta). Renato Fasano / I Virtuosi di Roma. Not for sale. Available for archives and libraries from the Istituto di Ricerca per il Teatro Musicale, via Francesco Tamagno, 65, I-00168 Roma.

Giovanni Paisiello (1740-1816) was one of the most successful opera composers of the late 18th century. He was court composer to Catherine of Russia and Ferdinand of Naples, and *maitre de chapelle* for Napoleon Bonaparte, First Consul of France. Today, his eighty operas are seldom performed, and few recordings of his works are currently available. Although modern critics may be correct in accusing him of lack of profundity, his historical importance is undeniable.

Il Re Teodoro in Venezia was composed in Vienna in 1784 (libretto by Giovanni Battista Casti) and premiered at the Burgtheater there on August 23rd. By 1800, the opera had been performed in Germany, Italy, France and Spain. There are two principal manuscript sources to the work, one in Naples, one in Vienna. In 1960 Elena Barbara Giuranna prepared a revised edition of the opera for RAI (Italian radio), which was subsequently produced and broadcast in 1962 in Torino under the direction of Renato Fasano; a recording of this production is preserved in the Discoteca di Stato in Roma.

The present volume is a critical study of the various sources of *Il Re Teodore*, focusing on the two manuscripts and the Giuranna revision. It is preceded by a presentation of Paisiello and the opera. There is also a facsimile reproduction of the original libretto printed in Vienna in 1784. The differences between the sources are analyzed in detail; although they are relatively small, they illustrate how the work changed. The main part of the publication is taken by the complete libretto of opera, indicating parts included in the Vienna manuscript but omitted from the Fasano recording.

As far as I have been able to determine, there are no commercial recordings of *Il re Teodore* available. This is a shame, because apart from the scholarly value of this publication, it is a wonderful recording of a lovely piece of music. The Discoteca di Stato and IRTEM are to be congratulated for making the work more widely available - if only for other archives and libraries.

Pekka Gronow

Rainer E. Lotz: Black People. Entertainers of African Descent in Europe, and Germany. With CD Record. 398 pp. 1997. Birgit Lotz Verlag, Jean Paul Strasse 6, D-53173 Bonn. 130 DEM.

It is generally agreed that the first jazz records were made in the United States in 1917. The diffusion of Afro-American music to Europe began already before that date, but documentation on both recordings and visits by performers has been scarce.

For more than a decade, German discographer Rainer Lotz has produced a long series of publications and sound documents related to the early years of jazz and related forms of Afro-American music in Europe (and elsewhere in the world). *German Ragtime* (Lotz 1985) is a discography of ragtime recordings published in Germany. *Under the Imperial Carpet* (Lotz & Pegg 1987) is a collection of essays on black history, including black musicians and variety artists in Europe. *Black People* takes up both of these themes.

Before the development of radio, television, and the movies, there was a huge demand for live entertainment in all major European cities. Theatres, music halls, restaurants and other venues featured singers, dancers, comedians, magicians and other entertainers, and the theatre circuit provided livelihood for thousands of performers. Most of them offered audiences well-tryed traditional entertainment, but this circuit was also a breeding ground for new fashions and ideas. Towards the end of the 19th century, there was a noticeable increase in the demand for black entertainers, not only from the United States, but from the Caribbean and African colonies. In the year 1896, for instance, the show business trade publication *Der Artist* listed more than one hundred black performers in Germany alone. Part of this demand must have derived from a general interest in the unusual and the novel. As Germany became actively involved in colonialization towards the end of the century, African topics became fashionable, and the Hagenbeck Zoo in Hamburg included a 'Sudanese Village' among its exhibits, with inhabitants imported from Africa. But the early black entertainers also introduced forms of Afro-American music and dance, including rags and cakewalks, to Europe.

Black People is a collection of fifteen essays on various aspects of early black music in Europe, with discographies. There is also an introductory essay on German ragtime recordings and other related sound documents (including music box cylinders with ragtime composition). Typical of the artists included is Belle Davis, born in New Orleans in 1873 or 1874 and last heard of in Paris in 1929. Belle Davis had become known as a variety performer in New York around the turn of the century. In 1901 she arrived in England, where she was billed as "America's Greatest Coon Cantatrice of the Century". Lotz has been able to put together an extraordinarily detailed documentation

of her career in Europe, which took her from the Empire in Edinburgh to the Apollo in Vienna, the Casino in Riga and Villa Rode in St.Petersburg. Belle Davis made records in England in 1902 and (silent) films in Germany.

Other performers documented include Seth Weeks, Pete Hampton, Will Garland, Arabella Fields, Louis Douglas, William McAllan, the Bohee Brothers, The Musical Spillers, The Black Troubadours, and The Black Diamonds. Most of them were originally from the United States but spent years, sometimes decades in Europe. William McAllan was born Willi Panzer in Berlin in 1909, the child of a banjo player from British Somaliland and a variety artist from Germany. After a career as a child star in silent films he became a drummer in various dance bands in Berlin. After Hitler's rise to power in 1933 he moved to Switzerland. He spent the war years in Istanbul and became a leading figure in jazz circles in Turkey, returning to Germany after the war.

The documentation of the essays is extraordinary, ranging from photos and movies stills to reproductions of personal documents and detailed travel itineraries compiled from theatrical periodicals, but the reader of course wonders what kind of music these artists actually performed. Fortunately the book is accompanied by a Compact Disc which contains many extremely rare early recordings. The selection is good and well reproduced, but there are few surprises here. The ragtime recordings (including Seth Weeks' 1901 *Handicap March*) sound like contemporary American ragtime recordings. Belle Davis' *The Honeysuckle and the Bee* contains elements of syncopation, but the vocal style is not distinguishable from other early (white) American popular performers. From the viewpoint of jazz history, the most impressive recording is Pete Hampton's *I'm Going to Live Anyhow Till I Die* from 1904, which has vocal and rhythmic elements which tie it together with much later schools of jazz singing. But there may be other surprises to come: many of the recordings listed in the discographies have so far not been found.

References

- Lotz, Rainer E.: *German Ragtime & Prehistory of Jazz*. Chigwell, Storyville 1985.
Lotz, Rainer E. & Ian Pegg: *Under the Imperial Carpet. Essays in Black History 1780-1950*. Crawley, Rabbit Press 1987.

Pekka Gronow

Horst J.P. Bergmeier and Rainer E. Lotz . Hitler's Airwaves - The Inside Story of Nazi Radio Broadcasting and Propaganda Swing.- New Haven and London: Yale University Press, 1997. Price £22.20, including free CD

In the old days before digital radio transmission, if you wanted to trudge into the field of radio broadcasting you would first consider the need for wattage, the greater the better to carry your voice. Back in pre-FM days, the strongest stations, most easily received, carved out the largest slices of the listenership pie for themselves.

And if you were running the radio propaganda works for the Nazi government, you would spread your bets and hold as many radio stations and transmitters as you could either fire-up or simply commandeer. By 1943, in the short-wave department alone, the *Kurzwellensender* (KWS) had twenty-three wave-sparkling towers, together thrusting 1.5M watts in a rainbow of propaganda. The portfolio was invested in various War Zones, depending on target audience and the relative hard-or-soft-sell of the propaganda message. It took loops of individuals to achieve this, many radio professionals, many foreign. For instance, Americans: Jane Anderson, Robert Best, Douglas Chandler, Donald Day, Leo Delaney. These names are likely unfamiliar to the reader of this work but their backgrounds as failed journalists, actors and, in the case of Otto Koischwitz, a failed academic from New York University's Hunter College, help to explain their participation in the Nazi propaganda.

It took more than just microphone flamboyance to run these stations and the conditions were not without risk. The radio studios were like sand castles in the wake of Allied ground advances and bombings. And the radio voices constantly danced to the ever-shifting winds of wartime politics, a whirlwind that made the free market economy seem like the peacetime civil service.

The authors weave countless individual stories of the participants, their motives and fates. The on-air personalities' motives were splayed as one might expect in a world suddenly gone to war. We read of reluctant collaborators lucky to find an escape from prison camps and still wake up every morning; more than a few celebrities of Nazi radio who enjoyed their deep pockets of Deutschmarks in a country otherwise generally grindingly poor; others of course were simply rabid hate-mongers. There is a curious wheel of spoked narratives, each perfectly plotted with a coda of the individual subject's demise. After the war not everyone received justice, regardless of the degree of media attention to their trials. Both Lord Haw Haw and Mildred Gillars were arrested rather quickly because each refused to keep a low profile. Ezra Pound took the appropriate and opportune avenue, spending twelve years in an American insane asylum and thus avoiding a trial for treason. Given the dust long settled on each case, these stories stack up like the obituary morgue of a major newspaper. As a single pastry takes hours to prepare, the authors have synthesised numerous sources to

compose each biographic sketch. Diaries, letters, war records, vintage press, oral history, and other publications have been all folded together rather neatly.

Another startling facet of this book is the section devoted to propaganda stations of disguised identity. *Post du Réveil* was beamed covertly to the French from Stuttgart with an intentionally weak transmission signal and employing presenters who sounded inexperienced, a ruse which kept some French citizens ill-prepared for invasion. Some of these covert stations had little real success. Few Americans, in a country even then glutted with medium-wave radio and not fearful of the war spreading to home ground, gave much credence to a short-wave station proclaiming to be headquartered in the Iowa corn belt. While the book has a world focus, it is naturally centred on the countries in which bullets and bombs formed the dialogue.

Followers of wartime strategy will no doubt enjoy the chapters devoted to the evolution of the structure of the radio propaganda web. Impressive research into the personal papers of Goebbels and the like are shared by way of frequent excerpts of diaries and correspondence. For those who wish to better understand the behind-the-scenes politics of the Nazi government, *Hitler's Airwaves* will be an amusing if grim satisfaction.

For me, the best bit concerns what was possibly the first Top 40 station. Actually, it was a 'Top 60', the Nazi's then-latest beam, in Belgrade. As the radio outlets in the Nazi portfolio increasingly became rooted outside of Germany proper, it became uncouth for anyone to wear a uniform in the studio. They were each feeling lucky to avoid the hazards of real war and receive a liveable salary too. The underfunded Radio Belgrade only had sixty discs in its library. So, the staff played them.

One song became rather popular, a disc of *Lili Marleen* by the cabaret artist Lale Andersen, who 'owned' the number in her act throughout the 1930s. At this point the program director decided to pull it, only to receive audience feedback via the post, the only way possible by then, telephone opinion research not having been invented yet. Some of the station's audience was Allied too. As the programmers were in fact professional broadcasters and only reluctant soldiers for the Nazi war effort, they knew in their radio hearts that to please their listeners was their prime purpose. Dr. Joseph Goebbels deemed it "defeatist chirping [translated]", had the record banned and the singer was then deprived of work.

But there is no stopping a runaway hit, even in wartime, especially when the exploiter is a radio station with a limited playlist. Goodness, the song even inspired answer versions, proof of a popular song's perceived coat-tails. Although *cover versions* of songs appeared in America on competing record labels, given a proven hit song,

answer records, aiming for the crumbs of a mega hit's topicality, would not emerge until the late 1950s, mainly due to the tape-recording-sampled Flying Saucer records, themselves pastiches of existing familiar hits. But wait for it, German musicians re-cut it in English for their Allied audience and the BBC broadcast it in German for their Nazi audience.

The section devoted to Charlie and his Orchestra will appeal to collectors of the swing music jazz of that period. Hardly any of the musicians, it seems, had any ideology other than to wait out the war and still retain their profession.

Despite the publisher's publicity and perhaps all other reviews you may have read of this book, its thesis is not about the music, despite the free CD containing a selection of it. Charlie (Karl Schwedler) and His Orchestra were not among the most memorable of swing bands, mainly because, like the International Sweethearts of Rhythm, an all-woman and non-white American swing band of the 1940s, Charlie's repertoire was based on already-existing swing music. As the authors confess early on, the music was pretty darn good to the average listener, but not nearly in the league of Duke Ellington, Glenn Miller or Ambrose. Then again, they were not aiming for popularity in record shops or jukeboxes. And all of these propaganda recordings together did not have the impact of a smash hit like *Lili Marleen*.

In Charlie's case, the amusing propaganda parodies of Cole Porter and the like are mere flecks in the psychological shrapnel of that war. The appendix of the Charlie Orchestra's and their associates' known propaganda lyrics reflect the recordings, some of which have been made commercially available in recent years. Briefly, an excerpt, to the tune of *Bye, Bye Blackbird*:

"I never cared for you before,
Hong Kong, Burma, Singapore -
Bye, bye, Empire!"

Meanwhile, the wartime discography of these musicians, while of little relevance to the body of the book, is a welcome coup and the canon of jazz history is enriched for it.

One station was actually pitched, apparently sincerely, to encourage post-war humanist co-operation. The Hilversum-based Radio Arnheim, thanks to programme director Helen Sensburg, considered accurately the post-war order and preached an era of peace and prosperity for both Germany and the Allies. She apparently featured BBC news and music rebroadcasts, reports from Reuters, and even announced a

disclaimer prior to the remote Lord Haw Haw broadcast. Hers was perhaps the only genuinely pacifist radio station of the conflict.

The anomaly of Radio Arnheim aside, the Nazi propaganda radio organisation was cunning and duplicitous, with fear and indecision as its main audience. It covered the listener landscape with a nauseous unease. Only a trace of this unsettling programming is transcribed in the body of the book and even less on the CD. By comparison, in the two-volume *The Glenn Miller Army Air Force Band: I Sustain The Wings* by Edward F. Polic (Scarecrow Press and Institute of Jazz Studies at Rutgers University, 1989), there are over four-hundred pages of programme scripts. Perhaps typed transcriptions of full Nazi propaganda broadcasts could be published some day. Then we would get the flavour of the relentless ranting of Lord Haw Haw and his microphone mates, even if the aural documentation of whole programmes no longer exists.

As the book makes deathly clear, Nazi radio propaganda was most wounding through its words.

Andrew Simons

Andrew Simons is Jazz Curator at the British Library National Sound Archive

Marion Matters. Oral history cataloging manual.- Chicago: Society of American Archivists, 1995

Although oral history documents are synonymous in most people's minds with taped sound recordings my experience of using jazz oral history collections in the United States earlier this decade was mostly confined to reading transcripts because either the original tapes had not been copied and were in no fit state to be played back or there was actually no equipment available on which to play them. As for catalogues, I was lucky if the library could produce a hand-list. Although I assume that this is not indicative of the *status quo* in all American oral history repositories it is clear that a tool for organising oral history material to an acceptable standard (i.e. as hybrid documents, incorporating sound and text) has been an urgent requirement. Marion Matters' compilation of rules and procedures laid out with exemplary clarity in the *Oral history cataloguing manual* goes a considerable way to matching that requirement.

However, do not expect it to provide answers to all of your "cataloguing" questions. This is strictly a *cataloguing manual*, which means that it will enable you to compile consistent and standardised descriptions of interviews and collections and to supply a

main heading and “added entry” headings sanctioned by those descriptions. You will not find guidance on designing or selecting databases to hold your catalogue records nor on their management once implemented. Neither does it prescribe a system of subject analysis and indexing, on the assumption that “repositories using standard lists of headings, such as Library of Congress Subject Headings, will continue to do so”. This may be a fair assumption for American repositories but may disappoint those from other continents. (To be fair, a manual of subject indexing for oral history requires a separate and more bulky compilation by itself: it is an area of documentation which is notoriously difficult to address and maintain on account of the high specificity of terms and the cost of the intellectual effort involved. Not surprisingly, therefore, some repositories have preferred to rely on keyword indexing and free text search engines).

To help assess these rules from a strict *cataloguing* point of view, there are, to my mind, four principles on which the viability of a set of cataloguing rules for specialist material is based: logical and consistent presentation of rules; harmonisation with existing and pre-eminent standards; expressive of the realities of the subject matter in a manner which is clear to the researcher and economic for the institution to apply; be mindful of future electronic/digital environments.

Since the *Manual* has largely been derived from already widespread cataloguing tools, namely *Archives, Personal Papers, and Manuscripts*; 2nd ed. (APPM) and *Anglo-American Cataloguing Rules*; 2nd ed. AACR 2) we can take it for granted that the rules and their presentation are consistent. Matters has followed the traditional areas of bibliographic description (where appropriate) found in AACR2 and derive the structure for the extensive Notes area from APPM. Internal punctuation is derived from ISBD while application of the rules to a database environment assumes adoption of USMARC format, though this is clearly not a pre-requisite.

As to meeting the second principle, the compiler’s aim “to mainstream” oral history cataloguing is to be applauded since it is crucial to avoiding the fate of isolation (“many people believe that if it isn’t in the catalog - especially ‘in the computer’ - it doesn’t exist”) which can befall collections which are not text-based and for which the traditional tools are typically deemed unsuitable. This *Manual* is proof that such a compromise can be achieved and it is also important to note that a similar strategy has been adopted by IASA (International Association of Sound and Audiovisual Archives) in the development of its own set of cataloguing rules for sound recordings, including oral history.

At the same time the *Manual* will help libraries and archives to prepare their oral history material strategically for the so-called digital future, the “library without

walls". For although it makes no explicit reference to emerging metadata formats (all of which, e.g. Dublin Core, post-date its compilation) it is clear that harmonisation with those formats is dependent on the use of mainstream procedures. The rules in this Manual for describing holdings at the collection or repository level are going to be very useful in this respect as well as offering a welcome, albeit temporary, solution for hard-pressed cataloguing staff unable to maintain full cataloguing commensurate with incoming collections.

Also helpful, particularly in financially constrained times, is the guidance it gives on depth of description. Essentially, with Matters, you have two levels to choose from. The most basic level encompasses what she terms "fundamental information". Fundamental information is defined as that which is required "to identify the material described" and "to distinguish it from other material". Rules pertaining to this level are clearly marked in the right-hand margin for ease of reference. They include titles, names, dates, transcripts, scope and restrictions on access. The second level supplements the basic level with optional information to help users evaluate the usefulness of the material (e.g. extra information on provenance, physical characteristics, location of copies, etc.) and guide users to related materials.

Evidently, considerable measures have been taken, despite the overall "mainstreaming" aim, to ensure that these rules address the requirements of the subject matter. There is scarcely any sign that oral history practice has been shoe-horned into the AACR mould. For instance, Area 2 "Edition Area" and Area 6 "Series area" are not applicable to most oral history recordings, so the rule is simply "do not use", unless the recordings appear on commercially issued products, in which case, as the compiler rightly states, you should turn to AACR2 itself for guidance. And that old chestnut, the "chief source of information", which has needlessly occupied the rule makers for sound recordings for decades, is elegantly side-stepped by proclaiming that information must be derived from *any* source which will enable the "level of fundamental information" to be achieved. Sources regarded as useful for this are: abstracts, indexes, or other finding aids (nicely vague); the aural content of the interview; container label; interview or project documentation (i.e. correspondence, interviewer worksheets, etc.); reference sources; transcript. Meanwhile, key oral history concerns such as provenance and restrictions on access are built, with appropriate weighting, into the notes area.

My only dispute is with the use of the Title Area, a rare instance of forcing material to fit the mould. Oral history projects and programmes will normally have a title but individual interviews do not. Hence the necessity, according to Matters, to supply a title consisting of a form element ("Oral history interview(s)"), a name element (interviewee's name in direct order) and a date element (date(s) of interview). The

advantage of this is that it presents the essential identifying and distinguishing information in a very prominent position. The disadvantage is that it assumes adherence to the out-dated policy of creating main *and* added entries, a policy which was evolved to meet the needs of card catalogues. In a computerised catalogue (assuming, of course, that you have been able to afford one) where entries index themselves and the information can be laid out as a sequence of discrete fields this solution becomes tautological, using up indexing space and cataloguers' time. I also question the need to use a title element beginning "Oral history interview", especially in the context of a repository which is exclusively concerned with oral history material. One would not prefix the titles of other kinds of material in this way, e.g. music or actuality, but cover such form-based approaches through classification schemes.

I mentioned above the clarity with which these rules are presented and it is difficult to envisage how such information could be better expressed and presented. There is scarcely any trace of professional jargon and intelligent use of typefaces and layouts will enable even novice cataloguers to apply the Manual with ease and confidence. The rule text is also backed up by more than thirty pages of examples, which could in themselves serve as templates for cataloguing, and an index.

Other extras include a set of tables for mapping the rules onto USMARC tags and vice versa which, together with the emphasis on Imperial measures within the rules themselves, would require modification if the Manual is to be employed outside the United States.

Chris Clark

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LETTERS TO THE EDITOR

Comment on: Peter Copeland *Equalisation of BBC Disc Recordings* (IASA Journal No. 9, pp. 34-48)

George Brock-Nannestad, School of Conservation, Denmark

I have studied the paper by Peter Copeland with some puzzlement, because some of the sections have not benefitted from relevant printed documentation available, and some of his conclusions and instructions to archivists will not hold true when these discs are played with modern styli, such as correctly tracing elliptical styli. On the other hand, other conclusions that Peter Copeland has drawn essentially from his sources 1) and 3) are remarkable achievements in themselves, again emphasising his mastery of tables of discographical information as an input to technical features.

It seems that Peter Copeland has fallen prey to a common misconception concerning working with the history of technology, because he has applied present-day understanding of phenomena without realising that those who applied the old technology did so under the influence of *their* understanding. (This lack of perspective is not unknown when an archivist ventures outside his personal experience, *vide Note 1, Lit. 1*).

It is absolutely essential that any actions and decisions made at the time, leading to reports and/or artefacts surviving for study today, are understood in their proper *context*. Only this way can one determine a) what was aimed for, and b) which means were applied. Obviously it does not make it easier that we are looking at reports and artefacts generated fifty to sixty years ago which were continuously superseded by what were considered to be "improvements" at the time of *their* introduction. This means that if we do not put ourselves in the old context, we are refusing to accept the difference in culture, and we will be unable to communicate.

In the present case, Peter Copeland has failed to realise that an organisation like the BBC, creating recordings for in-house use, was completely independent - and indeed very different - from the concerns of record companies (which he has studied in detail) who needed their recordings to be playable on as many types of gramophones as possible. The size and independence of the organisation made sure that they could invest in development outside of standard commercial equipment and prescribe technical procedures according to a different order of priorities (as an example, take the BBC's early use of 60rpm for disc recording). In such a situation, technicians are trained in-house, and it is by studying the training and technical instruction material

that one may learn about the “technical culture” of BBC. This Peter Copeland has apparently failed to do.

The BBC was able to apply a *systems* approach to the problem of recording for later reproduction, because they themselves were in complete control. Obviously there were matters which they had to accept, such as a) the fundamental properties of recording materials and b) restraints on groove shape and modulation, if they wanted a cut record processed and pressed. However, the BBC accepted the compromises inherent in these two stages, so that they could avail themselves of outside, commercial, services. There is no doubt that this side of the BBC operation was run according to the best engineering principles [Lit. 2].

In the BBC's view, the fundamental idea behind disc equalisation was to create a “transparent” system which meant that records recorded according to the parameters of the system and later replayed on the equipment made according to those parameters would provide a sound as close as possible to the direct sound via the wire - *the overall performance*. Please note that we are not speaking of the *sound* present in the recording studio, but that available as an electrical signal distributed in-house on wire for the BBC's purposes. In the BBC, the internal standards defining the parameters of the system were the responsibility of the Engineering Division (but similarly every record company or broadcast authority had their own approach until general standardisation took over), and the users (i.e. technicians) only had to ensure by frequent testing that the complete performance criteria of the system were met. However, today we are in a different situation, because we are forced to “break” the system, since we have better pickups (less damaging) and amplifiers. It is very much like in photography or reprography where the total contrast curve from original via negative to positive is what matters, not the way that a “soft” negative has been compensated by a “hard” positive. However, an archive holding the negative must know what contrast was aimed for in the print - if they want to prepare one - and sound engineers in archives must now know the systems approach of old.

The *overall performance* was already the centre of attention in the BBC in-house Lit. 3 which prescribes calibration of the sensitivity of the cutting head by replay of the grooves just cut using the standard pickup. A standardisation is obtained by means of 1,000 Hz calibration disc No. XTR/27. The frequency response may be obtained from Lit. 4, in which Fig. 12 shows that the overall frequency response to be expected for the MSS system was from 70 Hz to 5 kHz (-4 dB at both ends and using the standard B.T.H. pickup). Reference is made to the test disc XTR.22 mentioned by Peter Copeland (p. 40) which means that it was still in use in 1938. (*Note 2*)

That the systems approach was that of the BBC is apparent from a relatively late reference, Lit. 5:

"It will be noticed that in discussing the fundamental considerations governing the choice of recording characteristic it has not been necessary to introduce conceptions [sic] such as 'pre- and post-equalisation', 'turnover frequency', or hypothetical 'constant velocity' or 'constant amplitude' characteristics." (p. 35).

Rather, minimum distortion (with spherical stylus, as was the fashion at the time) is aimed for. The same source stresses that it is in practice difficult to measure a recording characteristic, because it is so dependent on the pickup and record material. As an interesting example, the BBC recording characteristic is shown on Fig. 25, i.e. the INTENDED performance *as well as* the velocities recorded IN PRACTICE on Test Record XTR311 which as a matter of fact do deviate. Hence I must disagree with Peter Copeland when he claims (p. 43) the Test Record XTR311 to represent the INTENDED. This record does not represent the INTENDED performance at all, but rather the real world!

However, the worst deviation from the required replay characteristics proposed by Peter Copeland is created by the *radius compensation* used from 1941, the year of introduction of the 33 1/3 rpm coarse groove discs. This approach very clearly demonstrates the BBC's system approach: they felt responsible towards the end result - and were in full command. This compensation, which automatically added up to 10 dB of high frequency signal (dependent on the *radius* actually cut at any one instant), attempted to obtain the same high frequency content at replay, even when the groove came close to the centre of the disc (implying less than half the linear velocity or wavelength for a given frequency) while using the spherical styli of the day. This was obtained, in the words of a reference printed shortly after the introduction of this procedure, Lit. 6:

"To compensate for this, the tracking device [i.e. of the recording machine] is made to actuate a variable equalizer, which exaggerates the higher frequencies when the cutter is at the smaller radii." (p. 197).

The compensation was applied both for 78 rpm and 33 1/3 rpm records. Peter Copeland does mention the term *radius compensation* (bottom of p. 42), but apparently does not realise its present-day importance. Its importance is that present-day use of an elliptical stylus *will* reproduce the high frequencies faithfully, and hence we will obtain a radius-dependent exaggeration of the level of frequencies from 2kHz to the top limit of up to 10 dB.

Sean Davies' 1947 paper Lit. 7 (Peter Copeland's ref. 6) gives all the pertinent details, but somehow this is overlooked by Peter Copeland - he does not give any mention of this feature which very materially - and deliberately - affects the overall performance. From the reports of the contemporary discussions of Davies' 1947 paper (which was read on three different occasions, albeit reported at different locations in the *Journal of the Institution of Electrical Engineers* (Lit. 8)) it is clear that the BBC's approach was considered "unusual".

The 1950 reference Lit. 5 corroborates Davies' paper - we no longer have only the 1947 writings of a BBC engineer, but rather the "gospel", i.e. that which was taught in-house (pp. 33-34, 59-61, and 77-80). As Davies wrote, radius compensation was also applied to 78 rpm. Particularly, as regards PRESTO disk recorders, Type 6N and 8N (Fig. 48) are plainly shown with sliding contacts for radius compensation - how can this have escaped Peter Copeland's notice?

But not mentioning the fact that an elliptical and correctly tracing stylus will provide faithful tracing of the short wavelengths and will provide an increase in high frequencies, is in my view a distinct shortcoming for the period 1941-51 in the otherwise well-argued characteristics proposed by Peter Copeland. (*Note 3*)

In conclusion, I would have preferred an approach to the history of technology which takes into account the thoughts prevalent *at the time*, and obviously also research to such depth that serious worries and their contemporary solutions are not overlooked. Unfortunately, the misinformation created by publishing a seemingly authoritative paper in a single instalment for the archive community is difficult to eradicate. By not realising the systems approach of the BBC and therefore suggesting crude replay provisions, Peter Copeland has unwittingly opened a completely different can of worms - that of encoded signals which must be decoded on replay. From the world of analogue I would only here mention Dolby A (which already in the early 1960s was very dependent on calibration) and Dolby SR.

NOTES

Note 1 Schüller's dismissal ("... - although of minor importance - ...") of the difference in speed between old Reichsrundfunk tapes (77 cm/s) and the present standard of 76.2 cm/s shows that broadcasting is not his field. To broadcasting institutions it was very important indeed, because they calculate their programming in, say, half-hours, and if a tape is marked as having a particular duration, one would create either an overrun which is detrimental, because the next feature might be live, or a blank which must be filled. Cf. Lit. 5 p. 27 where it is stated that the 0.44% speed difference between American and English commercial 78s "... means that a one-hour programme recorded in America at 78 r.p.m. would occupy one hour sixteen seconds when reproduced in England".

Note 2 The BBC material to which reference is made (Lit. 3-6) also carries full documentation of the Marconi-Stille system and the Philips-Miller system used.

Note 3 A Technical Annex to the present Comment will be available from the School of Conservation at the end of 1997, describing the extent of the deviation from Peter Copeland's suggestions, using values taken from the BBC texts mentioned. In order to forestall any discussion of copyright, no BBC drawings will be reproduced directly.

REFERENCES

Lit. 1 Schüller, D., "Early Stereo Recordings on Magnetic Tape (1943/1944) and their State of Preservation", *AES Preprint* No. 3523, 94th Convention 1993 March 16-19 Berlin, p. 6, note 2.

Lit. 2 Watts, A., "Cecil E. Watts, Pioneer of Direct Disc Recording".- Agnes H. Watts, 1972, pp. 36ff, 48ff, 53ff.

Lit. 3 DISC RECORDING MACHINE Technical Instructions Item 6.2. (September, 1938), (pp. 5-7).

Lit. 4 DISC RECORDING MACHINE Technical Instructions Item 6.3. (February, 1938). (pp. 19-23)

Lit. 5 anon. (to the present writer): *BBC Recording Training Manual* (1950).

Lit. 6 anon. (to the present writer): *Engineering Division Training Manual* (BBC 1942)

Lit. 7 Davies, H. "The Design of a High-Fidelity Disc Recording Equipment", *Journal of the Institution of Electrical Engineers*, Vol. 94 part III, pp. 275-295 (July 1947).

Lit. 8 Davies, H. *et al.* "Discussion on [Lit. 7]", *ibid.*, pp. 296-300, 467-70.

Peter Copeland, The British Library National Sound Archive responds...

I should like to thank George Brock-Nannestad for his kind words and helpful comments. I believe most of the latter stem from the fact that he and I have different perceptions of the terms “radius compensation” and “recording characteristic”.

I was trained at the BBC Engineering Training School, and both the published textbook (my Ref. 3, pp.50-51) and my course notes (BBC Technical Operator Course No. 11, July 1961) show that “radius compensation” and “recording characteristic” were thought to be two separate subjects. I apologise for not making it clear that I was writing only about the latter; but I may well have been educated in the wrong ‘technical culture’. For several years before 1961, the same staff had been playing commercial records and BBC-made discs on the same apparatus, so the two ‘cultures’ had merged.

The published textbook by Godfrey and Amos [Ref 1] says:

“radius compensation . . . is therefore a compromise between distortion and frequency response, and since the results obtained are greatly affected by the disk material, by the shape of the recording and reproducing styli, and the behaviour of the reproducing head, the best compromise depends very much on the detailed nature of the equipment used, as well as on the extent to which the cutting speed is lowered to obtain a long recording time.”

Therefore radius compensation can never be as exact as a recording characteristic. To which I might add (from my own experience with such discs on-air), it also depended how many times the disc was played - and this was a non-linear effect, loud high frequencies being ‘wiped off’ the disc earlier than quiet low frequencies.

For this reason George Brock-Nannestad may be interested to learn more about the British Library NSA's policy, for which I am responsible. As a matter of urgency we have to get the sound off these nitrate discs; so we are attempting to get the “recording characteristic” side of the problem correct to a much higher standard than was ever done in BBC days. (Engineering test-discs are reproduced throughout their whole range to an accuracy of half a decibel with appropriate elliptical styli. We do not use XTR311 because, as George Brock-Nannestad says, it documents a “real-world” performance rather than the actual characteristic; but I’m afraid it documents the latter as well in the sense that it shows when the ‘2dBs-per-octave characteristic’ was intended). Reproducing-stylus dimensions are always noted, and sides are joined up to make a continuous performance as the original producer would have wished. At some future date I anticipate we may be able to improve the side-changes which are still

audible (although not as conspicuous as I remember when I was transmitting them), perhaps by an adaptive digital process still to be researched. The matter is not helped by the fact that we often do not even know if radius-compensation was fitted to the disc-lathes.

They say that "a prophet is not without honour, save in his own country", and I was pleased to hear that early BBC documents exist in Denmark which do not seem to survive anywhere here in Britain!

I regret having to make the next comment, but it is well-known that radius compensation was used for commercial recordings on Western Electric gear in the late 1930s. I wish George Brock-Nannestad could have raised his point when I published the same information in September last year (Ref. 1 to the *IASA Journal* article); the misunderstanding could have been laid to rest much earlier! Nevertheless, his contribution is a valuable extension of my article, and I thank him for it.

REFERENCE

Ref 1: Godfrey, J.W and Amos, S.W. *Sound recording and reproduction; for Wireless World*.- London : Iliffe & Sons, Ltd., 1952.- pp. 50-51.

(This is a reprint of an internal BBC manual of 1950, which may be the same as George Brock-Nannestad's "Lit. 5").

Wishing our readers a
Happy Christmas
and a
Happy New Year

* * *

Unseren Lesern
wünschen wir
fröhliche Weihnachten und
glückliches neues Jahr

* * *

À nos lecteurs
Joyeux Noël
et
Bonne Année

CONTENTS

Editorial	
<i>Chris Clark</i>	1
President's letter	5
<i>Sven Allerstrand</i>	
ARTICLES	
Audiovisual archives on the way to multimedia - the dilemma between stagnation and commercialisation [German version]	
<i>Michael Harms</i>	7
[English version]	14
The non-profit Commission on Preservation and Access (CPA) and its Task Force on Archiving Digital Information	
<i>Hans Rütimann</i>	21
The digital mass store in a radio sound archive: first steps into practice	
<i>Albrecht Häfner</i>	34
Digitizing audiovisual archive materials by outsourcing: a first approach	
<i>Klaus Heinz</i>	45
REVIEWS	67
LETTERS TO THE EDITOR	77