

iasa

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EDITORIAL

Helen P Harrison

Bogensee has been and gone and IASA produced a substantial amount, so much so in fact that only part of it can be reproduced in this issue. There is a lot more good work to come!

This issue contains the best - and the best - of IASA. Two articles came from outside the Bogensee conference, a real bonus and a treat for the readers. Both the papers were originally presented to the ASRA conference in Canberra in 1994. The first is from Diane Naphthali, a PhD student in NSW with a fascinating and thoroughly researched account, not only for Australians, of how music has been and is used in the movies, both silent and sound. Enjoyment is what IASA is about, so enjoy this article.

Of interest to all IASA archivists is digital recording. There was much discussion of this question in Bogensee following on the 'Memory of the World' Technical committee discussions. The second paper from the ASRA conference starts a series of articles from the Bogensee conference. Should we or should we not move to digital audio and digitise all our materials? Ian Gilmour's article introduces the concerns and then the proceedings from the session in Bogensee which started one of the joint sessions between IASA and FIAT which contained papers on whether to put one's faith in digital storage, and mass storage, with all the problems and practicalities.

This question is obviously one which will emerge again at every Technical Symposium or Technical session of IASA, we can present original material as far as it can be restored, but of course there are other aspects of ethics - how much do you interfere or tamper with the original, however poor or damaged it may be. We are talking not only of restoration, however careful and ethical our restorers may be, we are also talking of the treatment of the original *interpretation*. This is what worries me - I still want to hear the hums and fluffs (well - at least some of them), the original emphasis, the original interpretation of a great artist of a great composer's work! I do not want to hear some pristine, brittle so called 'improved' or badly 'restored' copy. This does no service to the artist involved - it may make a better recording of an indifferent performer, but that is something none of us wants. Leave that to the 'musak' people, or rubbish on answer phones - supposed to amuse. This is not what IASA is about. I suppose that this is why so many of our archivists insist on keeping the earlier bashed-up recording whatever its quality, just in case some better technology comes along to reproduce it. Good luck to them - we are a bit lucky here, it is not quite the same with film (especially nitrate) or older video - or are we? We might have a greater responsibility - we have a better opportunity to keep our material, but that is about all. We may have more of it than our other av colleagues, but more of it can be retrieved.

Another concern is raised in this issue, important for all archivists and librarians - the question of disaster preparedness and emergency procedures in a disaster. None of us wants it to happen, but disasters are always waiting and we should be ready to try and take counter measures. Anyone who has had a fire, flood or other emergency will know what it entails and will be grateful that some measures can be taken to minimise damage. Preventing disasters is as important as dealing with them when they occur, and this argument and advice will continue to be a concern for IASA.

Other papers in this issue have a considerable interest: one by Alena Troitskaya gives us an insight into the collections of the Phonogrammarchiv in St. Petersburg - an archive in transition. Other papers come from the Radio Sound Archives Committee session which presented us with a wonderful opportunity to look at the current situation of sound archives in Germany, especially Berlin and get a flavour of what was being put out under the regime of the previous occupant of the very house we were within - Goebbels. The papers show how the East German archives have been dispersed and absorbed into the new Germany, where these archives came from and information of their contents. We had a couple of associated visits during conference week to the Berlin archives concerned and these were an education in themselves. If ever you thought you had problems go and talk to your Berlin and German colleagues about how to convert archives and their records into files for access today - they are tackling it with some success but my goodness it is some problem!

One year into editing the IASA publications and it could be time to take stock, before launching into the next years. There have been five issues of the quarterly publication, the *Information Bulletin* (nos. 7-11) and two issues of the *IASA Journal* (nos. 2-3) which I hope you received almost on time. The two publications serve different purposes, the *IASA Journal* contains professional articles and reviews. Most of the articles are taken from the proceedings of the annual conferences, but in the past year there have been a few recommendations from members to include articles from other sources. Very welcome and an invaluable addition to the Journal. The content and bi-annual publication of the Journal leaves a gap for regular, up-to-date information and news and the *Information Bulletin* is published more frequently than the *Journal* to keep up with the changes in the archive world and in the activities of the Association itself, to keep the members *informed* about what is happening, where and when.

It is also time to acknowledge those people who have contributed so much during the past year. The Editorial Board of IASA consists officially of only two members at the moment. The Reviews and Recent Publications Editor, Pekka Gronow has my grateful thanks for his support during the past year and the efficient production of copy without reminder. It is a pleasure to work with Pekka. Printing and distribution of the Journal is carried out by Hungarian Radio ably supervised by Magdalena Cseve. She manages to cope with all the oddities sent in her direction with speed, efficiency and no fuss. Others need special thanks for their contributions to the publications. Albrecht Häfner as Secretary of the Technical Committee obtains suitable technically approved copy for the Journal, one has but to ask and usable copy is on its way. George Boston, another Technical Committee colleague lives close enough to be 'reminded' to supply information and does. Mary Miliano lives a long way away but is the provider of activities in Australasia and the Documentation World. A final debt of gratitude must go to all those contributors without whom there would *be no Journal*.

One of the pipe dreams, called 'good intentions', of this Board was to improve the IASA programme of publications. So far we have not got very far with this ambition, due to a variety of factors - such as getting the regular publications out and a lack of finance to realise the ambition. There is also the consideration of finding the right ideas and the people to produce the material. Such additional publications are required and we remain on the lookout for suitable topics and viable methods of publication.

MUSIC FOR THE MOVIES: AN OVERVIEW OF THE AUSTRALIAN CONTRIBUTION DURING THE SEVENTY-FIVE YEARS, 1894-1969

Diane Naphali, Sydney, Australia

Paper presented to the ASRA Conference in Canberra, 1994 and published by permission of the Australasian Sound Recordings Association

In 1995 Australia celebrated its film centenary, a reminder that we have one of the oldest film industries in the world¹. From its inception, and throughout the period under discussion (1894-1969), music played an important role. In support of this statement, two personal accounts are offered which relate to music and the Australian film. The first concerns Raymond Hollis Longford (1873-1959) a visionary and motion picture pioneer who became Australia's leading film director in the silent era; Longford is considered by some to be the 'Father of the Australian film industry'². He died an anonymous figure, largely forgotten by the industry he helped to found. Raymond Longford was my grandmother's first cousin, with a reputation in our family as an able raconteur, given to monologues about his career in the Australian silent film industry. He was present, with other family members one Sunday afternoon at my grandmother's family home in Henley, Sydney, sometime in the 1950s. Overawed by his commanding presence, I can still picture him, declaring at the afternoon tea table,

'I think music is so important in films. I used to have musicians on my sets to keep the actors in character and to keep the story going'.

I did not understand what he meant at the time. I certainly do now. The other anecdote concerns Ken G Hall (1901-1994), arguably Australia's most successful director of feature length motion pictures which he made for Cinesound between 1932 and 1940. In my first interview with him in 1992, he looked at me quizzically and said,

'You know, I've been interviewed hundreds of times but no-one has ever concentrated solely upon the music in my films. I thought it was so important at the time still do. I always went for the heart-strings and music in my films helped me achieve the effect I was after. "Hammy" was the man at Cinesound who changed it all and made it all happen for the first time'³.

Both accounts reveal the importance the two directors placed on music and the visual image as artistic partners in their film making. While these reminiscences give specific accounts of both directors' realisation of this issue, a wider consideration of the subject at the time did not invite curiosity. Consequently, music with films became marginalised to the extent that more often than not, it was mentioned only in passing. Contemporary works such as the authoritative Pike and Cooper's *Australian Film 1900-1977: A Guide to Feature Film Production* and Peter Pinne's *Australian Performers: A Discography from Film, TV, Theatre, Radio and Concert* are two reference tools which head us in the right direction. Melbourne-based historian Chris Long has illuminated the debate with scholarly research. As well, certain texts pertaining to the history of Australian film provide data *passim*. But if you search more deeply, the scarce account of this vast activity which involved a great many creative people in the period, disappoints.

THE SILENT ERA

MUSIC AND PRODUCTION

Of the two hundred and fifty silent feature films made between 1906 and 1930, only thirty exist in whole or in part today.⁴ Surviving films and stills reveal themes of bushrangers, of pioneering men and women and of city dwellers; music making is often portrayed as a central pivot to the plot. Characters engage in musical activities from bush dances accompanied by portable instruments, to soirée entertainment provided by piano pieces, parlour songs and dances, to venues where jazzing participants dance the latest craze, from ragtime to foxtrot.⁵ These musical influences which were imported largely by way of Europe and America, were portrayed in Australian films because such exotic roots had become part of our musical tradition.

Surviving original film music found in the National Library, Canberra suggest composers and music publishers produced short, episodic orchestral pieces of a passionate nature which were clearly intended to augment the emotional content of the film. It is likely they were played on a solo instrument such as a piano or organ or arranged for an ensemble or small orchestra. An instance of this is Raymond Longford's production of *The Woman Suffers* (1918) premiered in Adelaide with 'special incidental music for this production by the famous Theatre Royal Orchestra under the direction of Mr W Cade'⁶.

THE SALVATION ARMY

The Salvation Army was Australia's biggest producer of documentary films in the period 1897-1910, making over three hundred films, hundreds of slides and sound recordings; about one tenth are extant⁷. This approach had its genesis in the Army's Limelight Department when Joseph Perry and his wife began touring Australia with a slide projector to raise funds for the organisation's social work in 1891. Local corps officers provided suitable hymn accompaniment. During the 1890s Herbert Booth, son of the Salvation Army's founder, joined the circuit travelling with two, sometimes three musicians. In 1897 the Limelight Department acquired a movie projector and began producing secular as well as religious films. By 1900 the unit became known as the Biorama Company with most of its film commissions coming from the Australian and New Zealand Governments. At its peak, there were twenty-one Salvation Army units touring with its films and own orchestra - the largest comprised twenty players. Their multi-media lectures could last up to three hours and involved music, slides, films and sound recordings⁸. Orchestra members were multi-skilled and able to play an astonishing array of instruments. An existing photograph of Sid Cook (1872-1937), a Biorama musician, has him posing in Salvation Army uniform in front of the instruments he could play - brass, woodwind, strings, organ, concertina, autoharp and even tuned percussion comprising bottles and glasses filled with varying levels of water. Their repertoire was drawn from the *Salvation Army Song Book* together with popular songs of the day, such as *Home Sweet Home*, which were given a religious text.

THEME-SONGS

Theme-songs were written by Australian composers in the silent period, to accompany imported - and on rare occasions - local films. Jack O'Hagan (1898-1987) claimed he was the first to realise this potential in 1921, when *Anatol* was published by Allans' in

Melbourne and featured with the screening of Paramount's *The Affairs of Anatol*. Some twelve O'Hagan songs were dedicated in this fashion. In the silent era (and the later sound era) a host of Australian song writers followed O'Hagan's lead; of interest is Reginald Stoneham, who was his own publisher because he could not interest commercial houses in his music. His only theme-song was *Foolish Wives* published under the Reginald Stoneham imprint in 1922. Will Prior, the American music director at Sydney's Prince Edward and later, State Theatre, published two theme-songs, *Love Nights* (1924) and *Old Fashioned Rose* (1929).

MUSIC AND EXHIBITION

Music and exhibition had its genesis in 1894 in a converted shop at 148 Pitt Street Sydney when five electric-powered Edison kinetoscopes promoted as 'The Wonder of the Age, the Mystery of the Day' offered patrons for the cost of one shilling the chance to view, through an eyepiece, a fifty-foot looped film running at forty frames per second. Musical accompaniment was provided by gramophones. In 1895 in Charters Towers, then Queensland's thriving gold-mining centre, three Edison kinetophones were exhibited. Edison's latest development was in fact, a kinetoscope with the phonograph fitted internally; the additional feature was spoken dialogue and music on the sound-encoded wax cylinders heard through stethoscope tubes plugged to the patron's ears. A playlist of recommended popular pieces for individual films accompanied each release, allowing the exhibitor to select a program from the Edison catalogue.⁹ A national tour followed - as far west as Adelaide and the event marks the beginning of music in partnership with motion pictures in Australia.

CINEMA VENUES

Cinemas became destination venues in Australia from 1905, known as 'the pictures' or 'the flicks' and were established in city (and later), in suburban and rural centres. Venues ranged from picture palaces which featured large pit orchestras to smaller affairs in which films were accompanied by a trio or solo pianist.

Music in the silent era was employed for three reasons. First, it masked the clattering projector and the shuffling noise of moving furniture and audience chatter. Second, in the absence of spoken language, musical cues provided a decoding device enabling audiences to interpret the action of ghostly, flat images on the screen; third, musicians accompanied the 'live' part of the programme when vaudeville acts performed and singers 'plugged' the publishers' theme-song or latest hit-songs.

THE REPERTOIRE

From earliest days, exhibitors imported music compilations with orchestral parts - mainly from America - for use by their orchestras.¹⁰ What was the repertoire which accompanied the silent film in Australia? *The Australian Band and Orchestra News* published an interview with Sam White, Melbourne's Capitol Theatre Director in its March 26, 1926 issue in an article titled 'Art of Fitting the Pictures. Capitol Musical Director tells how it is done'. Sam White revealed that the orchestra, in his opinion, 'the pick of Australia' was promptly 'at their post ... ready for business, answering every movement of my baton'. The music they played consisted of excerpts from grand opera, comic operas, musical comedies, ballet suites, symphonies and overtures. Music he included, but considered to be of a 'lighter vein' were fox trots, one-steps,

waltzes, marches, polkas and schottisches. It was usual to use eight different themes repeated several times during the 'silent drama' and it was the task of the Capitol's music librarian to ensure that parts were copied for the orchestra and placed on each music stand before every performance. Their day began at 9.30 am and finished at 10.30 pm. They played six days a week. Is it any wonder that film-struck Australians in this period heard a great deal more of the so-called 'better class of music' than is realised? Patrons were given a performance of concert music every time they went to 'the pictures' and research into this area supports the view that selections from the Romantic Movement from Beethoven to Tchaikovsky and some music from the Nationalist School of the early twentieth century Dvorak, Rimsky-Korsakov, Smetana, Sibelius, Grieg and of course Elgar, found their way into the larger cinemas and in many cases, major suburban houses as well. A substantial amount of this music would have been recognised by patrons due to the high incidence of individual Australians who were 'learning the piano' or 'learning an instrument' or 'taking singing lessons'. Lessons led to external examinations set by The Trinity College, London or The Royal School of Music, London whose syllabus requirements at the time included styles of music cited above. The regular film-goer in the cinema would have heard concert music as often as was heard in the concert hall in Australia, albeit in abridged forms.

THE MUSICIANS

The Mitchell Library in Sydney holds fascinating photographs of cinema musicians on a videodisc, *At Work & At Play : Our past in pictures*. A search of the subject Orchestras locates photographs of three cinema orchestras taken in 1905, 1926 and 1930. Instrumental line-up and dress of the players vary, according to the musical and social convention of the day.

The earliest photograph, 'Orchestra at Lyceum Picture Theatre, Deniliquin 1905' shows a pianist with the five players in day wear. The musicians, seated around the piano with six instruments - cornet, trombone, euphonium, clarinet, wooden flute and violin - are photographed in front of a corrugated iron wall. Such a location was confirmed by Thorne, who wrote that in rural centres, films were screened by exhibitors using such venues as 'fenced-in open yard, plain brick or iron barn-like buildings ... [sometimes with] a pen for the orchestra.'¹¹ As well, travelling picture showmen operated throughout Australia, even to the most remote rural communities up until the coming of sound, always touring with a pianist or furnishing some other form of music. By 1926 there was greater sophistication, not only in style of dress but in the architectural venue of the cinema as the photograph of 'The Palm Court Orchestra in Albury, 1926' reveals. Its dual role was that of cinema and dance orchestra. The eleven players are led by a conductor and players wear (mostly) evening dress. The line-up is piano, strings, woodwind and percussion. The third photograph shows the 'Harristocratic Orchestra, Barellan 1930' which played for silent films, Bachelor and Spinster Balls and Matrons' Balls. The pianist is dressed, flapper style, the men in evening dress. Two instruments appear for the first time - the saxophone and banjo, both instruments favoured in Australian dance bands from the early 1920s.

LIVE ENTERTAINMENT

The 1920s was the hey-day for live entertainment in the cinema. Exhibitors vied for foreign musicians to feature in lavish stage productions in their cinemas and

Australians were beguiled by their influences. American organists became 'essential' to realise the full potential of the imported Wurlitzer organ which they played with dazzling showmanship. Orchestra leaders from Europe - often violinists - were favoured for their Continental manner and exotic flair, demonstrated in a repertoire of mid-European Gypsy rhythms and virtuoso treatment of the violin. It was our cultural cringe that found us regarding foreign musicians so highly. Australian exhibitors continued to favour the live cinema entertainment style which was in vogue in America and *Everyones*, their weekly trade journal, faithfully reported the trends and repertoire which was fashionable across the Pacific. Commercial enterprise found Australian music publishers issuing the latest popular songs with leading orchestras or organists prominently displayed on sheet music covers. Piano roll manufacturers - Mastertouch in Sydney and Broadway in Melbourne - recorded, cut and issued popular songs which were the current craze in cinema stage presentations; Australian artists also recorded these songs. Sound recordings, sheet music and occasionally piano rolls pedalled on a playerpiano, were promoted in cinema vestibules; live performances received wireless broadcasts from the larger venues to 'listeners-in' - and Australians loved it.

THE SOUND ERA

MUSIC AND PRODUCTION

Experiments with sound-on-disc shorts (some with music) began in Sydney and Melbourne as early as 1927. Norman Dawn, an American director, had made two silent films in Australia¹². He produced Australia's first musical, *Showgirl's Luck* on location at a hotel in Lapstone, outside Sydney in 1930. It contained no local music and actors mimed to commercial American recordings. The first Australian musical film was *Out of the Shadows* (1931) with music by Lionel Corrick and Jack O'Hagan (who also wrote the theme-song) and performed by Sid Hollister, Lionel Corrick, Ern Pettifer and members of Melbourne's Palais De Danse Orchestra.¹³ In the 1930s feature films were made in Melbourne by EFFTEE Productions and the company's musical shorts called *Non-stop Variety* (sometimes labelled *Efftee Entertainers*) showcased a variety of musical talent. This included singers such as Kathleen Goodhall and Jack O'Hagan (accompanying themselves at the piano), instrumentalists, vocal ensembles and even the Melbourne Chinese Orchestra - certainly the first ethnomusic group to be heard on sound-encoded film in Australia. In Sydney, Cinesound began recording music for shorts and news gazettes produced by other companies and played by a four piece orchestra in the Studio theatre. When the company began making feature films in 1932, the film music was recorded at the State Theatre by the orchestra in the pit, conducted by Hamilton Webber. Later, a sound shell was built at the studio in Bondi and after a visit to Hollywood by Ken Hall and Clive Cross (sound recordist) in 1935, the company purchased back projection and a playback sound system for their studio. For the first time in Australia, pre-recordings were played back through loudspeakers to the performers and (if the plot required it) the dance band or orchestra on the set. Hall believes this made it possible for Cinesound to make musicals. The acclaimed musical drama *The Broken Melody* with its operetta climax written by Alfred Hill (1870-1960) was conducted by Hamilton Webber and involved soloists, the Richard McLelland choir and members of the Sydney Symphony Orchestra.¹⁴

If we analyse the musical input in feature films from 1930 to 1969 - over ninety of them - some interesting figures emerge. Over seventy composers contributed original film scores - some in collaboration. The musical director was given credit for twenty

four films - which generally meant the score was a compilation of published music. Twenty two films featured a theme-song on the soundtrack, featured as part of the film's narrative. Ballet and bush dance sequences appeared in seven films, 'pop' groups in four films, the piano was essential to the plot in four films, the harmonica was used on the soundtrack to set the mood in three films and in *The Broken Melody* (1938) the leading man, played by American Lloyd Hughes, begins his road to fame as a composer and violinist and later achieves world renown as a conductor; Hughes 'conducts' the operetta sequence in the film's climax. As in silent films produced in Australia, characters play, sing, dance and demonstrate an exuberant enthusiasm. There was little thought given to the idea that producers could make a lot of money out of the film's music. At best, the theme-song was published and recorded at home and occasionally recorded by an overseas recording artist. But apart from scores written by foreign composers for films shot on location here, some of which was released commercially, little film music found its way onto sound recordings. An exception is a musical excerpt from the Lindley Evans score for the Cinesound production (1937), included on the LP *Music from Great Australian Films*, Neon Philharmonic Orchestra conducted by William Motzing, ABCCL 8202 (1982).¹⁵

A glance at the names of those involved in the industry reveals a 'Who's Who' of Australian composers at the time - some composers of concert music, others composing for musical revues, pantomime or radio.

To mention a very few:

- * George Wallace - inspirational comic, nimble song and dance man
- * Alf Lawrence - composer of theme-songs for the early sound film *The Hayseeds* (1933)
- * Hamilton Webber, Musical Director for Stuart Doyle's Melbourne and Sydney State Theatres and after 1932, for Cinesound in Sydney
- * Henry Krips, an emigre from Austria in 1938, who composed film scores, popular songs, and became Conductor of the South Australian Symphony Orchestra
- * Alfred Hill and Charles Mackerras, both achieving in their time, international reputations in the concert hall
- * Sydney John Kay, an emigre to Australia before World War II. He anglicised his name (and included his adopted home Sydney in his title). He wrote feature and documentary film music, theme-songs and music for radio shows. 'A selection of tunes of *Bush Christmas* (1947)' for piano, from the motion picture of the same name appeared in 1947, published by Chappells'.

WOMEN COMPOSERS OF FILM MUSIC

Women composers remain unrepresented as feature film composers in the period under discussion. However their contribution to the documentary film in the same period was imposing - Esther Rofe, Dulcie Holland, Mirrie Hill and Moneta Eagles.

ABORIGINAL MUSIC AND FILM

Film makers showed little endeavour, in a musical sense, to transcribe tribal Aboriginal music into film music. The sacred chants and secular songs of our

indigenous people would remain largely outside the mainstream of commercial film until its belated acknowledgment in Australia's so-called **New Wave** of cinema, which evolved in the 1970s and beyond.¹⁶

OVERSEAS PRODUCTIONS AND FILM MUSIC

Certain overseas production companies used Australia for their location, bringing with them leading actors, directors and technicians. The scores for these films were commissioned from overseas composers who enjoyed an international reputation including Vaughan Williams, John Ireland, Matyas Seiber, Ernest Gold, David Buttolph and Georges Auric. Dimitri Tiomkin's score for *The Sundowners* (1960) received international approval.¹⁷ This deliberate exclusion caused a degree of hurt and bewilderment among Australian composers at the time. Some of them, notably John Antill, Esther Rofe, Kurt Herweg and Dulcie Holland had been composing documentary film scores since the mid-1940s and their success in mastering this new medium was not only musically exciting and professionally executed, it was seen at the time - and a view held to this day - to be an enormous step forward for film music in this country. Others had already written film scores for Australian feature films and documentaries, such as Willy Redstone, Charles Mackerras, Alfred Hill, Sydney John Kay, Lindley Evans, Raymond Hanson, Dorian Le Gallienne, Peter Sculthorpe, and Don Burrows. Only three - Alfred Hill and Henry Krips for Columbia Pictures' *Smithy* (1946), and Sydney John Kay for the Rank Organisation's *Bush Christmas* (1947) - were invited to write film scores for foreign films produced in this country in the period under discussion. The impression at home was that Australian film music was dismissed as unimaginative, lacking originality and verve. The inference can be drawn that, at the time, overseas production companies were somewhat unaware that film music was being written for the local product.

MUSIC AND EXHIBITION

Sound in films caused an economic disaster for musicians playing in pit orchestras; it also forced a down-sizing of live entertainment in cinemas, Australia-wide.

CONCERNS

By 1928 trade journals had announced the arrival of 'canned' music to accompany silent films. Apparatus such as the Western-Gray electric phonograph with remote control was offered to exhibitors with claims that non-synchronised mechanical music out-performed any orchestra. While most orchestras were maintained because most productions were still silent, late in 1928 synchronised films were shown in major cities with a warning that 'the days of a small orchestra with piano are numbered'.¹⁸ Rumours circulated that exhibitors were under pressure from sound equipment suppliers to wire their cinemas and dismiss house orchestras; falling box office returns in silent houses prompted 350 exhibitors in Australia's 1,250 cinemas to wire for sound.¹⁹ In April 1929 the oldest established orchestra was dismissed from Sydney's Haymarket Theatre; Fullers' Management, theatrical entrepreneurs, withdrew from vaudeville to concentrate on 'talkies' causing performers in vaudeville houses and cinemas everywhere to be retrenched. By December 1929 there were 2,000 musicians out of work.²⁰ Busking sprang up in city and country towns; Municipal Councils organised Unemployment Musicians Benefit Concerts, engaging some of their number to entertain people in public parks. 'Talked out by the Talkies!' became the catch-cry of the unemployed musician.

END OF AN ERA

The war effort between 1939 and 1945 caused reductions of man-power in the industry, such that live entertainment after the war never returned to the halcyon days of the 1920s. Music remained as live entertainment in many cinemas in one form or another after the war, a feature which continued into the 1950s. However, by the time television was introduced into Australia in 1956, this kind of entertainment had disappeared.

The history music in the Australian film industry is a rich tapestry on which many enterprises have been woven. Film music in the industry today has its roots in the pioneering work of many sung and unsung composers and artisans.

(Diane Naphali is a music historian, enrolled as a research student at the University of NSW. Her PhD thesis is concerned with aspects of music within the Australian film industry, 1894-1969.)

FOOTNOTES

1. Ray Edmondson and Andrew Pike. *Australia's lost films: the loss and rescue of Australia's silent cinema*. Canberra: National Library of Australia, 1982, p.9.
2. The Australian Film Institute presents an award in his name for outstanding contributions to Australian cinema.
3. Ken G Hall, interview with the author, tape recording, 20 April, 1992, Sydney. The "Hammy" he referred to was Hamilton Webber, his musical director from 1934 to 1938.
4. Edmondson and Pike, *ibid*.
5. Australasian Film's *Does Jazz Lead to Destruction?* opened at the Globe Theatre, Rushcutters Bay, Sydney in 1919. Originally titled *Why Mabel Learned to Jazz*, the premiere featured a special jazz week where 'Miss Ethel Bennets and Mr George Irving demonstrated the Walking Waltz, the Jazz and the Tickle Toe'. Eric Reade. *Australian Silent Films*. Melbourne: Lansdowne Press, 1970, p.106.
6. Adelaide Advertiser. 23 March 1918.
7. Chris Long, personal correspondence with author, 9 July, 1993.
8. *Federation Films*. [VHS videorecording] Produced by Chris Long. Canberra: National Film and Sound Archive, 1991.
9. Chris Long. 'Australia's First Films: Fact and Fables. Part one', *Cinema Papers*, 91, January 1993, pp.38-9.

10. Lewis de Groen was employed by T J West Theatres ca. 1910 as their Sydney-based musical director to 'arrange the music for West's Sydney, Brisbane Perth and New Zealand shows'. Diane Collins. *Hollywood Down Under: Australians at the movies 1896 to the present day*. North Ryde (N.S.W.): Angus & Robertson, 1987, p.82.
11. Ross Thorne. *Theatre Buildings in Australia to 1905: From the time of the First Settlement to the arrival of cinema*. Sydney: Architectural Research Foundation, University of Sydney, 1971, p.219.
12. Clive Cross remembers: 'I appeared briefly in Dawn's *For the Term of His Natural Life* (1927). Dawn used to have a pianist and violinist to play *The Prisoner's Song* repeatedly for all the 'touching' scenes to get everybody in the mood'. Interview with author, tape recording, 6 September, 1992, Sydney.
13. Chris Long. *National Film and Sound Archive Newsletter*. Canberra: NFSA. 1987.
14. Ken Hall. *Directed by Ken G Hall*. Melbourne: Lansdowne Press, 1977, p. 100.
15. Robert Levis was an announcer on various radio stations in the 1940s. He recalls: 'There was not much in the way of Australian films. We knew about the Dad and Dave films and the George Wallace films. But there was no film music that we knew of, on record. We played the soundtrack transcriptions of the latest Hollywood musicals which were sent from America - large 16" 78 rpm discs - *Two Sisters From Boston comes to mind*. Interview with author, tape recording, 5 March, 1994, Sydney.
16. Isador Goodman's score for Charles Chauvell's *Jedda* (1956) contains references to Aboriginal musical idioms. Clive Douglas essayed an aboriginal motif in some of his documentary film scores.
17. Robert Levis agrees: 'Tiomkin was a clever man. He captured something there in that film that appeals to me today. The music helps enormously in depicting Australian culture at that time, in a historic context'. *ibid*.
18. *Everyones*, 9 January, 1929.
19. Graham Shirley & Brian Adams. *Australian Cinema: The first eighty years*. Sydney: Angus & Robertson and Currency Press, 1983, p.104.
20. John Tulloch. *Australian Cinema: Industry, narrative, meaning*. North Sydney (NSW.): Allen and Unwin, 1982, p.48.

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Tulloch, John. *Australian Cinema: Industry, narrative and meaning*. North Sydney (N.S.W.): Allen & Unwin, 1982.

DISCOGRAPHY

At Work and At Play [Videodisc] Sydney: Mitchell Library

Federation Films [Videorecording] Produced by Chris Long. Canberra: NFSA, 1991 .

INTERVIEWS

Cross Clive. *Interview with author, 6 September 1992*.

Clive Cross (b.1912) worked as sound recording engineer for Cinesound Productions, 1930-1946. He is an amateur pianist and music-lover.

Hall, Ken. *Interview with author, 20 April 1992*. Ken Hall was director and producer of Cinesound motion pictures, 1932-1946.

Long, Chris. *Interview with author, July 1993*. Chris Long is a Melbourne-based researcher. His current interests include aspects of the history of Australian media, principally film, print and sound.

Levis, Robert. *Interview with author, 5 March, 1994*. Robert Levis was the first Artistic Director of the National Playwrights' Conference and Co-Director of the Independent Theatre North Sydney. His current interest is in film archives.

EMERGENCY PREPAREDNESS AND DISASTER RECOVERY IN AUDIOVISUAL COLLECTIONS

Gerald D Gibson, Library of Congress, Washington DC

Paper presented in the Technical Committee session during the IASA/FIAT conference in Bogensee 1994

In addition to work with colleagues in IASA on this topic, the Library of Congress recently assigned me the responsibility to analyse the facilities and needs of its Motion Picture, Broadcasting, and Recorded Sound Division (MBRS) and to develop an emergency preparedness and disaster recovery plan for the audio and moving-image holdings. The following is a preliminary report of the progress at the Library of Congress on that work, and a request of assistance from each of you in gathering additional information on how to approach and meet this assignment. Unfortunately, the plan is far from complete and, except for the acquisition and placement of a number of very basic emergency supplies, its implementation has just begun.

Plans have been prepared and are routinely tested with scheduled drills, in most of our institutions for the safety and protection of personnel. While human life takes precedence when formulating the priorities of an emergency plan, and, in general, building codes are developed to guard against the risks of damage to facilities, little has been done to safeguard collections against the unknown. Most of us have sole responsibility for irreplaceable and valuable objects and collections of information essential to our collective national and international history and cultural heritage. As such, we hold primary responsibility to protect and prevent damage and loss to such materials.

It seems that all of us have made efforts in the past to protect our collections, some have actually carried through and have strategies in place. Unfortunately, if my conversations with you are correct, few of us have current plans or have implemented the procedures for those strategies in such situations.

A plan for staff will usually take into consideration a number of points, including general emergency procedures; building alarms and evacuations procedures; health services for emergencies; power outages; elevator safety instructions; and procedures to follow in the event of bomb threats or explosions, chemical spills, fire, and floods. The Safety Office at the Library of Congress has overall responsibility to review, maintain, and implement this plan. For obvious reasons, certain portions of any such plans remain confidential and are shared only on a need to know basis (for example, those parts of such a plan dealing with sabotage threats). Without such secrecy the plans, themselves, can and will be circumvented by the very people they are designed to protect against. Still, the key personnel must be entrusted with planned procedures or the plan is useless. If you do not have such a plan, please write or FAX me in Washington and I will send you a copy of the Library of Congress's strategy for staff emergencies. You can then see how we have approached the issue and modify it to meet your situation and needs. In return, I ask that those of you with such plans in place will, also, send a copy to me for the same purpose.

For collections, the Library of Congress has decided that the Preservation Office, shall have primary responsibility and authority. We have determined that we must assign specific personnel - with adequate backup in the event that they are not available - with assignment for each of the collections. These persons are responsible to prioritize collections and train staff within individual units, prepare and distribute materials on alert procedures for staff orientation and signage for visitors, establish and stock supply lockers/rooms with emergency supplies and equipment, and train appropriate personnel in each unit and be sure that support staff are, in turn, trained in recovery procedures.

The assignment of primary responsibility - an individual with specifically identified deputies - is the essential first step and should be done immediately, even if further actions are delayed. The individual must be given full support and all staff must know that in the event of an emergency this person and their surrogate/s speak with the full authority and responsibility of the entire institution. One of the first obligations of this assignment must be to establish a firm schedule for design and implementation of the components of the emergency preparedness / disaster recovery plan.

Emergency preparedness *must* be viewed as an ongoing process, consciously and methodically cultivated so that it becomes ingrained into the very fabric of your routine. No single written document will sufficiently address the issues for all situations. Nor should a "Plan" take precedence over the process of planning, prevention, and training. All such plans must be reviewed and revised on a regular scheduled basis. Further, emergency preparedness must be a collective endeavour. An emergency preparedness plan must of necessity involve personnel from all functions and disciplines. It must concern itself not just with storage and preservation specialists, but also with engineers, technicians, senior administration, management, and the full range of service groups in the institution.

The first step in such a plan is **Assessment Of Risks To The Collection**. It is either the very lucky or the very young collection that has not had at least one major emergency. Many, such as the Library of Congress, have had numerous situations over its life. In our case these range from the intentional burning of the collections during times of war, through water in storage areas from burst pipes and leaking sprinklers, to intentional acts of vandalism. One of the first steps of any emergency plan is to assess what emergencies have occurred in the past and to assess their potential for recurring in the future. When beginning this process at the Library we undertook a survey of how much damage would be done should a single sprinkler head go off. The criteria were to evaluate the numbers of items in various formats if stored on floor-accessible shelving in a 25 sq. ft. area, the designed coverage of many such devices. We found that such an event could have serious effects upon a surprisingly large number of items. In the area of audio and moving-image media, for example, it could affect as many as 38,000 acetate discs, or 50,000 magnetic tapes, or 90,000 vinyl discs, or 14,000 cans of 16mm film. We had to realize that, dependent upon how much time passed before the water was shut off and the standing water removed, the damage from the release of just a single sprinkler head would probably be an emergency beyond the capacity of immediately available staff in the various work units! The resources of the Library would be seriously affected by just one emergency of this magnitude, and it would probably require many weeks to recover and get back to normal. Assuming that irreversible damage was not done at the outset of such an emergency, there is a maximum of 48 hours before such things as mold growth would begin. Even before this, binders would break down and paper dissolve, ink on labels runs or is washed off, building structure can, potentially, be severely

damaged, electrical circuits can be overloaded and short circuit resulting in electrical fires. The list is very frightening to consider.

An important part of **Risk Assessment** is to develop a working file of blue-prints, or plans, of each of the areas where collections are, or might reasonably be expected to be located or used. Mark this plan with such information as : previous problems (leaks, chemicals problems, etc.), alarm boxes, in the event of the failure of lighting, what is the physical arrangement of the area so that personnel can move around with some confidence (where are the aisles, if using compact shelving, where are the controls to shift the stacks, etc.), what is the location for sprinkler and other water shut-off valves and who has keys to access them and authority to shut them off, where are the electrical switches, the master electrical boxes and shutoffs, hand-held fire extinguishers, and location of emergency supplies. These blue-prints should be located in multiple, readily accessible places, not just locked in the director's office. Some of the areas where they should be placed are in the security office, with the local fire department, at the home of key staff member/s and their deputy.

The Library of Congress concluded that, in order to respond as quickly as possible, emergency preparedness must include an established communications system a telephone tree, for example with appropriate 24-hour contacts for the local fire department, security offices, engineers, and the staff of each unit. This information should be reviewed at the time of *any* staff changes, should be clearly posted for all to see, should be part of the at-home requirements of those in areas of responsibility and authority, and should have clearly designated alternates in the event someone can not be reached as they are attending a FIAT or an IASA conference, for example.

Another important, but frequently difficult, decision is to **Prioritize Collections** to determine what is to be salvaged first. Most of us do not realize fully that time is at a premium when an emergency takes place. Staff must be made aware of this decision, and must be properly trained in how to evaluate the situation to determine if there is time to salvage even the most valued item in the collection. Of equal importance is **Training the Staff** to know **how** to handle an item and what to do should the most common problem -water- be coming into the area. How is the item handled? Does it need to be covered if water is cascading into the area?

A simple effort we can all undertake now is to determine, acquire, and maintain those supplies essential in the event of the most common problems. The Library of Congress found a firm, ReActPak, which sells a containerized package of some of the most needed items when an emergency arises: plastic sheeting, plastic garbage pails (the corrugated plastic container in which the supplies are shipped serves this purpose), large sponges, pails and buckets, flashlight with extra batteries, protective clothing (plastic aprons, gloves, boots, etc.), blotters to absorb standing water, inventory materials (paper, notebooks, soft pencils, waterproof felt tip pens, colored pressure sensitive tape, scissors, duct/boxing tape, and a first aid kit), and the like. In addition, we believe that additional stocks of such things as wet-or-dry vacuums, large sheets of heavy duty plastic sheeting (8' and 16' x 150' x 3-5mm. thick, for example), large fans to circulate the air, water proof tape to seal leaks in pipes, battery operated emergency lighting, emergency air support systems, zip-lock bags, plastic bubble-wrap, a large quantity of absorbent paper towels, a large roll of 24" wide polyester nonwoven fabric for interleaving, etc. Finally in this area, if such supplies are not readily available at all times of the day or night they are useless. This means that the supply lockers/rooms with emergency supplies and equipment must remain unlocked at all times. This, in turn, means that the supplies must be checked regularly and replenished as needed.

We are just now developing our list of emergency supplies specific to audio and moving-image media. I would welcome hearing from you if you have suggestions especially if you have experiences.

Even the best plan will fail if the staff are not *trained*, including *support staff*. This includes not only the in-house personnel but, also, such people as the local fire squad the worst nitrate film fire that I have ever personally witnessed was made *much* worse because the firemen did not know what was in the storage vaults, did not understand what it meant when told, and treated the blaze as a normal vault storage fire. Further, if they understand the importance and value of the materials in your facility they can possibly make minor modifications which will have major impact on your ability to recover the media and, hence, the data after the emergency is past.

As in much of our audio and moving-image world, the limited research and testing which has been done in this area - and it seems to be very limited - has been aimed at paper and paper-based materials. One of the few documents I know on disaster recovery of magnetic tape, for example, is a recent, not-yet published paper by Edward F. Cuddihy of California Institute of Technology's Jet Propulsion Lab at an ARSAG conference in Paris in May 1994.¹ I believe it to be of such importance that I will close my presentation with a summary of what Cuddihy recommends: "...polyester based tape which has become wet, as caused by a flood or accidentally dropped in oceans or lakes, should be kept *under* clean, cold water - nominally at 0°C - until such time as it can be carefully examined, cleaned of water borne debris, and - if the tape can be easily rewound - wound loosely onto another reel. This winding should, also, be carried out in ice-water to rinse the layers as they become unwound, or in a cold room having a temperature less than 11°C. The loosely wound tapes should then be placed in a vacuum chamber to dry-out. This chamber may be identical to those used for drying wet books or other wet documents. *Do Not Heat The Tapes*. For guidance, Dr Cuddihy points out that, under a hard vacuum, 12.7mm tapes require two to three days for total dry-out, and 25.4mm tapes require four to five days.

"After vacuum dry-out, expose the tapes to an ambient environment equal to their intended storage conditions. Again as guidance, Dr Cuddihy points out that this will, also, probably take two to five days at 20°C and 50% R/H, dependent upon the size of the tape reels and the conditions: *Do Not Attempt To Unwind The Dry Tape As It May Be Brittle*.

"After the tape has been acclimatized to its storage conditions an effort to carefully unwind the tapes should be attempted. Dr Cuddihy reports that tape which has been exposed to cold water (less than 11°C in his opinion), or moderately degraded tapes, should unwind with reasonable force which does not cause mechanical damage to or shedding of the oxide layer. If the tapes can be unwound, a tissue wipe on a standard tape cleaner is recommended before attempting playback.

"At this stage..., there may be two situations.... The first is that the tapes can be unwound and wound from reel-to-reel, but cannot be played without squeal, shedding, and so on. The second is that the tape pack cannot be unwound at all, without oxide damage.

"To achieve a playable condition, a high risk procedure can be attempted. This procedure involves heating the tape pack at 75°C, in vacuum or in dry nitrogen, in an

attempt to chemically reverse the hydrolysis reaction, to restart the binder chemistry and its mechanical and physical properties, and to reduce the quality of hydrolyzed products in the polyester urethane binders. There is a reasonable chance that a playable state may be achieved for tapes which could be unwound and wound prior to this heating, and a very low chance for very severely degraded tapes which could not be unwound prior to the heating procedure. Attempting the procedure is a risk/reward trade-off decision, and the heating procedure may have to be repeated several times...."

Dr Cuddihy does not specifically say so, but I believe it imperative that. once the above steps are completed, and presuming you are able to play the tape, it should be copied as soon as possible."

We at the Library of Congress have not tried this process, so I am not necessarily recommending it, only reporting the information which has come to me. If any of you have had experience in such cases we would all profit from your knowledge.

In conclusion, the Library of Congress, unfortunately, does not yet have an emergency plan for audio or moving-image media or data. We are in the first stages of putting one together and would welcome your comments and experience, particularly if you have been through a crisis with these materials, or you have such a plan in place. I would welcome hearing from you at your earliest possible convenience.

DISASTER EMERGENCY PREPAREDNESS

I. Staff Emergency Procedures

A. General Instructions

1. Building Alarms and Evacuations
 - a. Building Evacuation Assembly Locations
 - b. Building Evacuation Alarms and Notices
2. Safety Procedures
 - a. Building Evacuation Procedures
 - b. Fire Extinguisher Location
 - c. Fire Notice Procedures

B. Specific Situations

1. Health Service Emergencies
2. Power Outages
3. Bomb Threats and Suspicious Objects
4. Chemical Spills
5. Explosions
6. Fire
7. Flood and Water Damage
8. Medical Emergencies
9. Elevator Emergencies

II. Collection Emergency Procedures

A. Telephone Tree for Internal Use

B. Emergency Site Plan

1. Blue Print of Facility
2. Location of Alarm Boxes
3. Location of Fire Extinguisher
4. Location of Emergency Supplies
 - a. Contents
 - b. Use
5. Location of Water and Electrical Shut-offs
6. Location of Previous Problem Areas

C. Collection Priorities

D. Disaster Recovery

1. Staffing
2. Budget
3. Supplies
4. Procedures
 - a. Magnetic
 - 1) Open reel
 - 2) Cassette/cartridge
 - b. Film
 - 1) Nitrate
 - 2) Diacetate
 - 3) Triacetate
 - 4) Polyester
 - c. Grooved discs
 - 1) Wax
 - 2) Shellac
 - 3) Vinyl
 - 4) Acetate
 - 5) Polycarbonate/Optical
 - 6) Laminates
 - d. Cylinders
 - 1) Wax
 - 2) Celluloid
 - e. Mechanical instrument devices
 - 1) Rolls
 - 2) Music box discs

REFERENCE

Cuddihy, Edward F; Storage, preservation and recovery of magnetic recording tape. In: Actes des Deuxième Journées Internationales d'études de l'ARSAG, Paris 16 - 20 May 1994. *Environnement et Conservation de l'Écrit, de l'Image et du Son*. pp 182-86

CATALOGUING

A LOT OF INFORMATION: HOW TO PROVIDE ACCESS

Alena Troitskaja, Phonogrammarchiv, St. Petersburg

Paper presented at the Cataloguing and Documentation Committees session during the IASA/FIAT Conference in Bogensee, 1994

It was a great pleasure to present our archive at the Bogensee conference and gratitude goes to those who invited me and gave financial support, to colleagues from the Phonogrammarchiv in Vienna, especially Helga Thiel, and to Frank Rainer Huck of the Saarländischer Rundfunk. Finally Mary Miliano who spent time working on the English text of the paper.

The Phonogrammarchiv of the Institute for Russian Literature of the Russian Academy of Sciences is the oldest and largest collection of folklore sound recordings in Russia. It was founded at the very beginning of the twentieth century as part of the Slavic department of the Library of the Academy of Sciences. At present the archive holds about 150,000 sound recordings made in Russia and abroad.

The main body of material is unpublished folklore recordings from more than one hundred countries. The oldest recordings were made in the 1890s. The collection also contains some unpublished historical sound recordings, for example the voices of writers, actors and singers as well as the performances of famous musicians. In addition there is a phonotek which includes commercially issued recordings on 78rpm, LP discs, cassettes and CDs as well as a number of old and now rare commercial phonograms on wax cylinders. Incidentally we do not consider the commercial recordings as archival materials, regardless of rarity, only a first recording from which the master disk was made is treated as archival.

The value of every archive is not only in the quantity, quality and diversity of the collection, but also in its accessibility to scholars. This we achieve by publishing monographs and books about our collection, commercially issued selections from the collection on LP and of course through our catalogues.

The publication of monographs has been carried out systematically from the 1920s. During the last two decades we have also produced the LP series '*From the archival recordings of Pushkin House*'. This series presents samples of traditional folklore by authentic performers from different regions of the former USSR and the LPs include text and notational transcriptions of the songs.

However the books and records cannot cover all the archival materials. It is only the catalogue which can present the collections of the Phonogrammarchiv and its contents as a whole. Until recently there was only a card index to the collections with some added information indices. This was becoming inconvenient and cumbersome and in 1989 a computer system was introduced. The first stage of the transfer is completed, a collection level catalogue. The term collection in this context means all the sound recordings made during one field trip. The next stage will be to catalogue each item within the collections.

We have concentrated on a system which would be user-friendly and efficient for retrieval purposes. There are many kinds of data available and we had to decide which should be included in the catalogue descriptions. It is known that different kinds of data are necessary for different types of subject matter. The data of the Phonogrammarchiv is divided into three categories.

The first category includes data we can obtain without any further research; the physical and technical characteristics, information about where, when and by whom the collection was made and who the performers are. In Russian we call this data 'objectivnyne'. The translation of this word into the English 'objective' may not carry quite the same meaning, but I am unable to find a better one.

The second category is called analytical data; this means that some research is needed in order to ascertain the information. For example the musical structure of the tune, the number of syllables in the verse lines and text and notation transcription.

The third category of data is the classification. This is not an exact term, but means that this type of data depends on a theoretical approach existing in modern theory which is likely to change as knowledge advances. Such data includes style, genre, historical period and so on.

In so far as our main purpose is to facilitate searching for material in the vast bulk of sound recordings, attention is given mainly to the first category of data (objective data). We have found that scholarly requests are for material from a known region, or performed by a known performer, or gathered by known collectors. By including this objective data we can readily obtain the information required by the user.

Also for this reason we do not initially include the analytical and classification types of data. First of all it overloads the database and slows the search process; second a lot of research would be needed and we have a small staff and a large collection, a substantial part of which is in different languages. Also some of the analytical and classification work needs help from experts in language, in music, in the culture of different countries and peoples. This will be a job for the future, but we cannot afford to do it now - a familiar problem!

We do, however, enter genre. There are of course many different approaches to this category, and it is no exaggeration to say that the more scholars try to define genres, the more definitions of genre you have. For our internal purposes we use a genre classification system which was developed by a colleague, Vsevolod Korgusalov. It is based on the essential properties of the item, that is the item's function, formal structure and typology. But in cataloguing descriptions we restrict ourselves by using well recognised, everyday names of genres, which are not only in frequent use between scholars, but are well known for the native performers themselves. We are aware that the definitions do not reflect the essential characteristics of an item, and cannot be placed in a classification hierarchy. However we make a clear demarcation between classification and cataloguing. If classification assumes the hierarchical arrangement of material in accordance with its essential characteristics, the catalogue can sort out the items according to any data type. For our computer cataloguing system we have chosen such categories of data that are necessary for archival registration and for obtaining the information which is most often asked for by users.

The information is arranged numerically on the computer screen and includes:

1. Number of collection
2. Type of collection: field or studio
3. Type of carrier (wax cylinder, gelatine disc and numbers of such items 1-n
4. Number of items
5. Number of recordings
6. Method of collection
7. Date of recording
8. Date of receipt
9. Text transcriptions
10. Notation transcriptions
11. Publications associated
12. Level of restriction
13. Free field for information as necessary
- 14-16 Names of collectors
- 17-20 Country
- 21-26 province
- 27-36 Origin of performers - for those where the place of birth is different from the place of recording
- 37-42 Nationality of performers
- 43-47 Genres
 - 43 songs: lyrical, wedding, dance
 - 44 Epic genres
 - 45 lamentations
 - 46 prose
 - 47 instrumental music

We have three levels of restrictions for users. First: the collection is available for listening and part of the collection, no more than a quarter, can be copied for research purposes. Second: access to the collection may be permitted for listening but not copying. This restriction is mainly concerned with collections are directly connected with our own work. Third: the collection is closed for users, and is not included in users catalogues. This restriction is mainly concerned with collections which were deposited and depends on the ownership of the material. The exception in restriction is made for collections which the archive needs to copy in their entirety.

In conclusion we are now cataloguing at item level. The main principle is the same: comprehensive analytical description for every item will be entered in as far as the material may be researched. Everyone interested in our work is welcome to cooperate.

Reference.

See V. Korgusalev and A Troitskaya. *The Phonogrammarchive of the Institute for Russian Literature (Pushkin House) of the Russian Academy of Sciences, St. Petersburg*, The World of Music, NI/1993, for more detailed information about the collection and contents as well as for a list of sound recordings and a selected bibliography.

DISCOGRAPHY

THE GERMAN NATIONAL DISCOGRAPHY

Rainer E Lotz, Bonn

Paper presented at the Radio Sound Archives Committee during the IASA/FIAT conference in Bogensee 1994

A bibliography is a systematic listing of books. National bibliographies list all books published in a specific country. Such bibliographies are widely accepted as standard tools for librarians, archivists, researchers, dealers, scientists, collectors, etc. The usefulness of bibliographies is not questioned. In all civilised countries of the world such national bibliographies are constantly updated by professionals, they are being published, and they are being subsidized through public funds.

A discography is by analogy the systematic listing of discs containing recorded sound. But there the analogy ends. Ever since the invention of sound recording, more than one and a half centuries ago, there is very little systematic discographical literature available. The attempts at constructing or reconstructing national discographies - ie. the systematic and comprehensive listing of all sound documents made for, or in, that country - are very few and far in between. Exceptions are reported from a handful of countries whose recording industry was comparatively small anyway - Finland, Sweden, or Brazil come to mind.

Small that is in comparison to the big three: Germany, Great Britain and the USA. From the very beginning, the German recording industry was the largest in the world, but was severely cut as a consequence of the two World Wars. Even so, it is estimated that a mind boggling 1 million sound recordings took place in Germany during the 78rpm shellac era, between 1890 and 1960. To list them all would truly be a gigantic undertaking even if there were recording ledgers, or complete runs of company catalogues or comprehensive archival holdings of the original shellac discs. Unfortunately this is not the case and any German National Discography would depend on cumbersome autopsy of individual discs scattered all over the world, combined with Sherlock Holmes-type investigations and research.

This was the situation some 10 years ago when I decided to start work on a German National Discography - mainly for the reason that nobody else had undertaken or sponsored such work. With the help of a handful of collector/discographer friends we started gathering information for publication. Without doubt we should all be locked up in an insane asylum... But the first book was published as scheduled in 1991.

Not only did we go ahead but we also decided to apply the current state of the art in discography. No other discography that I know of goes into the same sort of detail. The entire output of the artists in question is listed in alphabetical order. The presentation of minute details includes not only the date and place of recording but also accompaniments, the names of lyricists and composers, the names of arrangers, accompanists and vocalists, and even the musicals, movies, operas, stage

presentations, theatre plays, books or any other original sources. This is followed by an identification of the labels and catalogue numbers of original issues and re-issues, and the date of first release. All unissued takes are listed as well, and the existence of test pressings is noted, when known. (In fact, we are finalists for the award for excellence in recorded sound research by the "Association For Recorded Sound Collections" in the USA).

However, we *exclude* details on personnel of instrumental performances because there is little or no such factual evidence for the majority of recordings, and we confine ourselves to the pre-microgroove era in order to have a chance to be complete and comprehensive. For the same reason we *only* list pressings and exclude private acetates, and wire or tape recordings.

The best way to produce national discographies is probably to embark on so called label discographies. Label discographies list all recordings made for a specific company, label, or catalogue series. Completeness can be demonstrated by organising such listing by matrix number or catalogue number - any omissions will then glare out as blanks in a numerical sequence. Label discographies are thus an almost perfect approach, and this is in fact how, for example, the Swedish Sound & Picture Archive proceeds. However, this approach also has the unfortunate tendency not to be economically feasible. Why? Because private collectors, and they constitute an important target group for such works, would find the books unaffordable if priced at cost.

To give you an example: Collectors of personality recordings i.e. literary cabaret, movie, chanson, and related genres - would not be interested in details on other recordings such as, for instance, classical music, spoken word, educational, religious, dance music, ethnic, etc. However, in the average record catalogue personality recordings account for only 5% of the repertoire. In other words: The buyer would have to dish out money for a book that is of no interest for some 95% of its content. A recently published book which lists only the acoustic recordings, of only one German record company, is priced at more than 400.- DM. I am afraid few private individuals would want to afford such a book.

Of course, the cost of discographies could be reduced considerably if they were not published on hard copy print media, but on microfiche, electronic data banks or CD-ROM. Unfortunately most potential users do not have the equipment, would not know how to handle it, and would not want to use it in the first place. For the time being we will probably have to continue printing old-fashioned books.

One way out of the dilemma is to prepare topical discographies rather than label listings. Topical discographies deal with specific subject matters, for instance specific instruments (the violin, the banjo), or specific musical styles (jazz or blues), or other such topics. This is the solution that we have decided upon. Our German National Discography deals with specific topics, in separate series of books. We started with those topics which we assumed to be of greatest appeal:

Series 1: Kleinkunst. Since 1991 three volumes have been published. Volume 4 is under preparation.

Series 2: Dance Music. Three volumes have been published, Volume 4 is under preparation.

Series 3: Operatic and Lieder. Volume 1 is almost ready to go to the printer.

Series 4: Spoken word. Again, volume 1 is almost ready to go to the printer.

This last series will give me an opportunity to touch briefly on the economics of the entire project. So far we have just about managed to recover our cost for printing and book binding. We are truly a shoestring operation and receive no subsidies or other financial support. As soon as the printing cost has been recovered we can go ahead with the next book. This we have managed so far but can a spoken word discography be sold on the market? From a historic, cultural, social, scientific point of view this is the most interesting and challenging series. Because of the scarcity of the recordings it is also the most difficult to research. What is more: For this series we offer another service to the user in that we provide abstracts of the contents of the recordings, and in some cases of historical importance even complete verbatim transcriptions of the speeches. To give you a rough idea of the range of recordings I will mention just a few names covered in the proposed volume 1: We shall include Rabindranath Tagore, the Indian philosopher; Paul von Hindenburg, World War I General Field Marshal and Reichspräsident; actor and movie star Heinrich George; Kaiser Wilhelm II; Erich Raeder, the Nazi Admiral of World War II; Alexander Moissi, the Austrian actor who recorded extensively before 1914; Sven Hedin, the Swedish explorer; Kurt Schwitters, the eccentric Dada artist; or Ernst Toller, the revolutionary writer. There will be entries covering such diverse aspects as the experience of hang-gliding in Brazil in the 1930s; fairy tale story tellers; Swiss German dialect recitations; humorous dialogues; a commercial advertisement to promote a device to fend off passengers from moving tramways; there are even sessions by a hypnotist.

Esoteric perhaps - but certainly fascinating. This series will be the ultimate test, if the institutions present at the Bogensee conference will not acquire the series it will fold. By the way: The cost of each book is exactly 100.- DM, plus postage. All the books have 288 pages and are paginated consecutively. That is to say, volume 1 of each series will start at page 1, the next volume will continue at page 299, and so on. Each volume includes an index covering the contents for all previous volumes in the series.

ECONOMICS

We can never hope to recover the cost of travel, research, typing, equipment and depreciation on the project. We just manage to recover the cost of printing. In fact, we are confronted with a vicious circle: the more esoteric the books - the smaller the demand; the smaller the demand - the smaller the print run; the smaller the print run the higher the price; the higher the price - the smaller the demand; and the circle starts again.

Our actual print run is a mere 300 copies! And this is the reason why we really cannot afford to distribute free review copies. We entirely depend on word-of-mouth propaganda. Whoever subscribes to the German National Discography will automatically receive the next volume published. All individuals and institutions on our mailing list receive a flyer if and when another volume hits the market. But here

we face another problem: most institutions buy through their local book stores and not directly from us. As far as we are concerned this has some negative consequences: first of all we have to pass on the wholesale discount which we would dearly love to keep ourselves...but more important, we do not know which institutions are buying the books - and since we do not advertise, the institutions will not know if and when a new volume is available.

Now, you may ask, why is Lotz doing this? Obviously this is not a money-making proposal. When Edmond Hillary was asked why he climbed Mount Everest his answer was reported to have been "Because its there". I suppose I'm doing it because nobody else was doing it, and because I am interested in recordings and discography as a hobby.

The rewards are little, the feed-back is poor. And I could certainly write my own version of the book "Games People Play".

Some 15 years ago, when I prepared publication of a book entitled "German Ragtime" and which is a discography of German sound documents relating to the pre-history of jazz in Germany, I approached the German Research Association for possible support. Of course they turned me down. The main argument of the bureaucrat was: What is the use of a discography if you cannot order the items listed? When I foolishly told him that the book even included items that are known to have been recorded, but are not known to exist any more, and even items which are known to have been destroyed he stared at me in bewilderment. Apart from ignorance we unfortunately also have to deal with jealousy. One knowledgeable gentleman, who could easily have helped a lot, complained about me. His argument was: "This man Lotz is obnoxious, he dominates the scene". To which I can only comment: "It is alright to criticize me; But where is your book so that I may criticize you?" Another unfortunate aspect I should mention in passing is stepping on "status toes", so to speak. A government funded archive withdrew its support mainly on the grounds that they really should be doing what I am doing. They advised me to withdraw my work from the market as they would consider doing something similar at a future date. Perhaps the most annoying game people play is to deliberately withhold information until after publication. Those individuals get a kick out of the possibility to say: I have a recording that even Lotz didn't know about. Another unforeseen development is that dealers in antique recordings identify items for auction with the quote "Not listed in Lotz"; meaning: this is a rare item commanding a special price.

Let me end that in spite of what I just written there are quite a lot of rewarding experiences as well. Some institutions have gone out of their way to support the project, including the host of the conference, the Deutsches Rundfunkarchiv.

Editor's Note

The *German National Discography* was included in a review article in a previous issue of the *IASA Journal*, no. 3, May 1994, pp 91-2. This article gives a flavour of the compilation, rewards and frustrations of the discographer who has the temerity to go into print.

RADIO SOUND ARCHIVES

GERMANY CALLING - GOEBBELS PROPAGANDA - JAZZ ORCHESTER IM ZWEITEN WELTKRIEG

Horst Bergmeier, Apeldoorn

Paper presented during the Radio Sound Archives Committee session at the IASA/FIAT conference in Bogensee 1994

I am a jazz record collector and like all such try to find out as much as possible about the men who play my beloved music, and about the environment which enabled - and sometimes necessitated - playing it.

Many years ago some odd 78 rpm shellacs came to light:

- The label informs that they were recorded by 'Charlie and his Orchestra'; furthermore it gives the song title (usually without crediting the authors), and a serial number - and that is all.
- There is no label name nor any company information to suggest the source of these records, and the records have to be identified by their label designs.
- There are no matrix numbers or other references engraved in the wax.

'Charlie and his Orchestra' play competently in the Glenn Miller, Tommy Dorsey and Artie Shaw mould, and when one listens carefully to the lyrics one quickly realises that they have been tampered with.

To cut a long story short; these recordings were made by the German broadcasting authorities during World War II for distribution to other radio stations, particularly in occupied and neutral countries, in order to liven up propaganda broadcasts. Accordingly, 'Charlie' records have turned up in Amsterdam and Brussels, in Vienna and Zagreb, in Copenhagen and Oslo, in what zoologists may refer to as 'specimen copies', that is to say as single, frequently unique examples.

These recordings remained for a long time a kind of mystery:

Because they are extremely scarce.

Then, they could not be accurately pinpointed, because the recording ledgers of the Deutsche Grammophon, the company which processed these recordings, were thought to have been lost during the war.

Thirdly, because the participating musicians feared the stigma of being seen as collaborators with the Nazis and were not prepared to speak about this particular period of their biographies.

Eventually, an unexpected stroke of luck came our way:

At the beginning of the 'nineties, parts of the recording ledgers surfaced and my colleague Rainer Lotz was able to obtain copies for study and exclusive use.

This discovery coincided with the opening of the archives in former East Berlin and former Czechoslovakia, providing further sources for information on the German radio's broadcasting and recording activities during the war.

Then we found some former members of 'Charlie and his Orchestra' who were prepared to freely discuss the orchestra personnel and the circumstances of these recordings.

This we (Rainer Lotz and Horst Bergmeier) welded into a study of the German radio's English language propaganda, entitled 'Germany Calling', a book due for publication by Yale University Press in 1995.

PERSPECTIVES

Nazi Germany did not discover propaganda - this was probably the Catholic Church, but the Nazi's were the first to turn propaganda into a military weapon and make it an integral part of their emerging concept of total warfare, in which air strikes and 'mind-bombing' would between them disable the enemy. There are a number of reasons for this.

At the beginning of the First World War, the British premier established an Office of Propaganda and in October 1915 the French premier set up a central propaganda agency, the Maison de la Presse. When the United States entered the war in April 1917, President Woodrow Wilson set up the Committee on Public Information with the journalist George Creel at the helm. Creel organised the government agency and fashioned propaganda in much the same way as today's marketing managers would with their commodities. Charlie Chaplin's 1918 movie 'Shoulder Arms', in which Chaplin dreams of kidnapping the German Emperor, and 'The Kaiser - the Beast of Berlin', as well as song's like 'We'll knock the Heligo out of Heligoland', 'We're going to take the Germ out of Germany', 'Just like Washington crossed the Delaware (General Pershing will cross the Rhine)' and 'If he can fight like he can love (Good night Germany)' were all products of this period.

In contrast with the Allies, the German High Command completely underestimated the importance and possibilities of psychological warfare. Hindenburg resented what he called any 'poisoning of enemy souls' and pointed out that in his belief a *decent* soldier should fight with a weapon in his hand. Eventually in August 1918, two months before the end of the war, a German aircraft dropped propaganda leaflets over enemy lines for the first time. By October of that year, the German air force had dropped 876 thousand leaflets which may be compared with nearly 65 million leaflets which the Allies had dropped over German lines during the war. After the war had been lost, groups on the political right in Germany worked hard on the German public to comfort their hurt pride and restore a sense of national honour. This they did by cultivating the so-called 'stab in the back' legend, according to which the German home front having become defeatist by insidious enemy propaganda, had fallen into the back of the undefeated German army.

Soon the National Socialists were to apply this theory of the decisive role of propaganda not only to explain the lost war and the failure of Germany's political and military leadership, but made this purposeful assertion their 'credo' and turned it into an axiom of their policy - policy became a function of propaganda, and propaganda effectiveness was to determine political actions.

Finally, one should not overlook the fact that Germany was a totalitarian state from 1933 and that the National Socialists manipulated and controlled the masses by a powerful propaganda apparatus that would neither be possible nor required in self-regulating democracies.

Consequently the National Socialists established a Propaganda Ministry as soon as they came to power in 1933, and Goebbels, the new Propaganda Minister immediately seized control over the German radio which until then had been a loosely knit organisation of financially independent regional companies, over which the German Broadcasting Company exercised a certain control - but effectively only in the technical sector. This, in the eyes of Goebbels, rather freewheeling situation was swiftly changed and Goebbels had centralised control over German radio in his Ministry.

In parallel with this organisational adjustment of the German broadcasting system to the new political demands, there was a massive drive to upgrade and extend the German radio's technical capability, and by the time of the 1936 Berlin Olympics, the German foreign language broadcasting system was ahead of all other countries in technology and equipment, in numbers employed and expertise in manipulating the minds of the people.

- In 1933, the German radio's foreign language capability amounted to two hours of broadcasts in two languages each day;
- in October 1939, the daily output amounted to 113 hours in 14 languages;
- by 1943 there were 147 hours of broadcasts in 53 foreign languages a day, including Gaelic and a number of dialects.

GERMAN BROADCASTING SYSTEM ORGANISATION

During the war, the Foreign Ministry demanded a leading role in foreign broadcasts by the German broadcasting system. If we look into the organisation of the German short-wave system, the so-called German Overseas Stations we see six overseas broadcasting zones and a German Zone which served Germans abroad in all regions who were 'estranged from the fatherland', to remind them of their ties and duties. Each broadcasting zone was staffed by commentators and broadcasters, translators and clerical staff who were all familiar with the political, economic and cultural aspects of their target region, and were fluent in its language. Indeed, most members of these broadcasting zones were either foreign nationals from those regions who elected to work for the German propaganda organisation or German repatriates.

Music was essential for broadcasts to the European and overseas regions in order to improve the entertainment value of the programmes, as Hitler held forth over lunch on 10 April 1942:

"Broadcasts aimed at England need to include a lot of musical material of a kind that appeals to the British, so as to get them more and more accustomed to tuning in to our stations if they can't get what they want on their home service."

So here we have a situation that some of Europe's top jazz musicians play a kind of music on the German radio foreign services which was, under the threat of very severe penalties, strictly forbidden to be played and listened to in the Reich.

Initially the broadcasting authorities hired hands as and when needed, but soon established a permanent radio orchestra under the direction of a tenor-saxophonist, Lutz Templin, who was not even a Party member. The orchestra was called 'Charlie and his Orchestra' after the band's frontman and crooner, Karl 'Charlie' Schwedler, an employee of the Foreign Ministry's USA broadcasting section, who is described as a kind of playboy. Schwedler was also responsible for the lyrics and, in 1943, was awarded the War Merit Cross for his services.

As more and more Germans were called up, Templin had to hire more and more foreign musicians to fill vacancies until his radio orchestra consisted of nine or ten foreign musicians, from Axis partner Italy, from occupied Belgium and the Netherlands, and included four German musicians only in 1943.

REACTIONS TO PROPAGANDA

What reactions were observed by British listeners and by the Allies to Germany's English language propaganda efforts?

Lord Haw Haw was born in the *Daily Express* on 18 September 1939. On this day the paper announced "Jonah Barrington, listening at the *Daily Express* short wave station in Surrey to the war on the radio, introduced 'Lord Haw-Haw.'" In fact Barrington did not invent the name at all, William Thackeray had already used the name in the novel *Vanity Fair*.

At the beginning of the war, the German propagandists started a calculated campaign to acquire a British audience and gain a measure of confidence and popularity. This they did by means of lampooning the dukes and dowagers, the Old School Tie, and the pukka sahibs from Poona - and the British listened. Parodied in *Punch*, caricatured in the daily press, His Lordship was held up to John Bull as a figure of fun. During the first winter of the war, the 'Humbug of Hamburg' was the comic character of the hour. His jokes were relayed in pubs and clubs, in the studios at Bloomsbury as well as in patriotic middle-class homes.

A music revue entitled 'Haw-Haw' played twice nightly to packed houses at the Holborn Empire:

Arthur Askey introduced 'Baron Hee-Haw' in the BBC's *Band Wagon* programme on 18 November 1939

and Michael Moore and Paddy Browne successfully toured Britain in a double act 'Lord Haw-Haw and Winnie the Whopper'.

In October 1939, the popular British double act of the Western Brothers recorded their version of 'Lord Haw-Haw of Zeesen' for Columbia (Col DB.1883). Kenneth (1899-1963) and George Western (1895-1969) were in fact cousins and had teamed up in 1925. Their trade mark was a pseudo-snobish image, as if they were too fatigued. They sported monocles and evening dress, and presented their own topical material of a satirical nature.

When the British government dashed Hitler's lingering hopes for a settlement, and stubbornly defied Britain's expansionist policy, Goebbels swiftly changed his stance and his psywar against Britain entered a new phase. Now, William Joyce - the British Fascist who had been tipped off that he was about to be arrested under the Emergency Powers Act at the end of August 1939, when war seemed to be inevitable, and had escaped to Berlin - decided to trade in on the celebrity of 'Lord Haw-Haw' and took over the mike, so to speak, and began blasting from Berlin against Britain, quickly developing into the most successful, but also the most resented, of all English language Nazi broadcasters.

Note:

1. Zeesen is a town some thirty kilometres to the south of central Berlin, where the German short wave transmitters were situated, while medium wave broadcasts to Britain were transmitted via Hamburg.

THE RADIO PRODUCTIONS OF THE DDR BROADCASTING SERVICE - AN ANALYSIS OF THE COLLECTION

Monika Brandenstein, Deutsches Rundfunkarchiv, Standort Berlin

Paper presented at the Radio Sound Archives Committee session during the IASA/FIAT conference in Bogensee 1994

After the dissolution of the broadcasting and TV stations of the DDR on December 31, 1991, their archives, basically remained intact as in previous time.

During the IASA meeting in Helsinki, Anke Leenings gave an overview about the administration and structural background of the period from 1991 to 1993. She also gave information about the collection of the music archive and their evaluation criteria.

The "Deutsche Rundfunkarchiv" has been located in Berlin since January 1. Housed there are the TV archive and the historical archive. In its sound archives, the collections of the radio and TV broadcasting services are united.

The basic structures, the contents and characteristics of the music, spoken word archive, as well as the sound effects library are summarized as follows:

Since the collection was reduced and parts were given away, the present collection of the radio broadcast carries about 400,000 items. This includes stereo magnetic tapes music, word and sound. The recording speed of 38.1 cm/sec is predominant. The collection was composed by five former all-day programmes and a fourteen hour programme of the DDR-radio broadcasting service, operating from 1945 to 1991.

A. THE MUSIC ARCHIVE COLLECTION

The biggest and most typical former production archive of the radio broadcast contains approximately 300,000 tapes. This collection is well patronized, but there are technical problems caused by hundreds of valuable documents in bad condition. The recording speed is still 76.3 cm/sec. At the present, they are rerecorded to maintain their availability for the future.

A large number of duplicates and parts of re-recordings were added to the items in stock, but inventories were never carried out. Servicing and the maintenance of the catalogues were also neglected. New recording techniques and other technical alterations in the broadcasting technologies recorded in the catalogues were neither consequent nor logical. These facts make it difficult to gain more detailed knowledge about the collection. We hope to finish the time consuming technical and organizational arrangement and inventory work by autumn.

Afterwards we have to work out a concept for technical storage and the main question will be whether to digitize or not. We have also to decide which collections are to be

considered and the one to start with. Data fields such as analysis, evaluation of music history and radio broadcasting history will become important tools in this process.

CONTENTS OF THE COLLECTION:

1. Own productions, recordings of events or studio productions, represent nowadays the biggest collection group of the DDR-broadcasting service with 138,895 items.

- Serious music (about 35,000 titles) with contemporary and classical repertoire. These recordings are by excellent orchestras and performers of the former DDR.
- Approximately 7,900 opera recordings with classical and contemporary repertory and interpreters of the former DDR. Among these are 240 opera long-shot productions.
- 3,750 operetta- and musical productions
- About 70,000 productions with entertainment and dance music of the former DDR
- About 13,500 titles folk music
- About 1,500 jazz titles
- Concert and event long-shots with about 52,000 tapes
There are, roughly speaking, 15,000 recordings from concerts. We have the Wartburgkonzerte of the Deutschlandsender, Dresdner Galeriekonzerte, series of concerts of the Rundfunkklangkörper in Berlin and Leipzig. Also of the Gewandhausorchester, the Dresdner Staatskapelle and other musical events.

2. A miscellany dating from 1945 to 1952, consisting of a few thousand tapes with a variety of provenance and musical genres. It contains music contributions as well as spoken word. Among these recordings are 200 tapes of the important Bach celebrations which took place in Leipzig, in 1950.

3. 26,779 tapes are available of educational and scientific broadcasts about music. Famous people analyze the history of music and contemporary works, and they do not only focus on the DDR.

4. More than 2,000 tapes could be classified under the headline 'political song'. It begins with the world festivals of youth and students in Berlin 1951, followed by Warschau 1955 and Wien 1959. Song festivals of the youth-organization "FDJ" and workshop weeks of their single-clubs are also available.

5. Also very interesting tapes are located in the folk-festival collection, with over 24,300 tapes.

6. The collection of external productions, a result of the, international music exchange, derives not from the provenance of the radio broadcasting service. There are about 50,000 music productions of all genres with famous artists and orchestras from all over the world.

7. There are also the 200 original recordings of incidental music from radio drama, composed by DDR composers like Matthus, Goldmann, Bredemeyer, Katzer, and Wefelmeyer, as commissioned productions.

CONCLUSIONS:

- After a period of more than 40 years, this big archive of music productions of the DDR broadcasting service, was subject of a first inventory and evaluation. The collection was also newly arranged and organized.

- Gaps in the collection are to be registered and the reason for their existence has to be deplored. There is, for example, the painful, but explicable, destruction of a large number of mono-productions, concerning the early creation of compositions in the DDR.

- After organisation and technical safekeeping, as well as through computerized cataloguing, the collection will find quick access to the ARD and the public.

- Points of attachment for scientific use of media - and music history are delivered, e.g. the examination of the policy concerning music in the broadcasting services, orchestra and chorus history, comparisons of interpreters, and so on.

B. THE SCRIPT LIBRARY

The script library, containing about 100,000 sound tapes, is a result of the single production archives of the different editorial sections. Besides a few hundred tapes, the majority is available in an acceptable quality. Most of them are recorded on magnetic tape with the speed of 38,1 cm/sec.

1. Until 1991, the task of the historical script library was to file the items of the productions and 10,000 tapes were collected. It would also serve other archives by taking over their material for permanent storage. Since the mid-1960s spoken word programmes were stored when the editor assumed that the recordings would not be needed anymore for repeat broadcasting.

The tapes of the complete edition were collected, including the important original sounds. A note of the origin (provenance) was made, but it never became an important retrieval criterion. Even though there are some gaps in the collection, it has considerable media and historical value and the collection value has been increased by adding tapes dating from 1945. Most of these recordings are simultaneous recordings.

OTHER ASPECTS:

- 1945 - 1949

The victory over the Hitler era. (recordings of allied statesman), the Nurnberger Prozeß, the foundation of the DDR, the first war criminals on trial.

- 1949 - 1989

Clearing away the ruins, rebuilding of factories, dams, laying of foundation stones; topping-out ceremonies, sound documents of national and international politics, restoration and openings of buildings of importance for the history of civilization. Festival Weeks, eg. on the occasion of the 200th anniversary of the death of J S Bach. Reports about the Dresdener Kreuzchor and Thomanerchor. Speeches and interviews of national and international personalities; sound documents about the history of broadcasting, restoration of churches eg.

- from 1989 on:

the Wende is documented in detail. There are tapes about the agricultural and social development, ecology, media, and sound documents about the Runden Tisch, the series Nachdenken uber Deutschland (reflections about Germany). Grass, Hochhuth, C. F. von Weizsäcker are some of the famous characters of the recordings.

2. The production archive of the script library contains about 40,000 tapes, many of them unknown recordings. About one year ago, the computer cataloguing of cultural programmes and broadcasts about literature was first being started. The final record number in the database will reach about 15,000 records. They will be soon accessible for the ARD stations to use for programme planning. They will be also available for scientific research and cultural institutions.

Cultural policy and art are well represented. Considerable gaps are among the subjects policy, economy, and agriculture of the Fifties and Sixties. Very popular DDR radio broadcasts of the fifties about music and literature were not kept in stock.

3. RADIO DRAMA PRODUCTIONS

About 23,000 tapes are to be considered as high-class within the international standard. This collection is the main emphasis for the public and the program supply.

The collection consists of:

- radio drama productions for adults

The duration of transmission is up to 55 minutes long. It applies to the majority of the 2,000 original radio plays. The first recordings were made in 1946. There are famous people who produced radio plays first. Some of them were already authors, others novice. Then they shifted to literature. Some of them were living in exile, or belonged, as well as others, later to the group of people producing literature in DDR.

700 to 800 productions are adaptations of radio plays about epic and drama literature. There are recordings of historical importance with famous artists of the late Forties and the Fifties.

- Short radio drama productions 396 of them are stored. Their main subject is about everyday life and experience in the DDR.
- Productions of international radio drama:
 - 885 radio drama productions were filed. Their authors are coming from more than 60 countries.
- Mystery radio plays including broadcasts:
 - Most of the 374 are focused on crime cases. They take place in the DDR and reflect the past DDR reality.
- radio drama productions for children.
 - * there are 2,203 different recordings. 331 of them are fairytales.
 - * 52 radio drama productions for juveniles. Their subjects come close to contemporary works and deliver a source for scientific research.
- Feature: Between 1964 and 1991 more than 1,000 features were created. There are master-tape features and literature broadcasts. They are important for the history of radio broadcasting and reflect contemporary history. Another value is added by frequently using original sound.

4. After the dissolution in 1991, the library of sports was handed over to the Script Library. 500 tapes represent the most important sport happenings and their highlights.

5. Last but not least - There are the sound effects recordings of the radio drama productions. They are stored on about 30,000 tapes. Their value is based on historical importance. There are sound recordings of transportation means, work and household appliances, and sounds from military life and actions. Some of these sound producers do not even exist anymore.

C. CONCLUSIONS:

- Most of the contents of the script library, belonging to the radio broadcasting archive of the DDR was subject to an inventory and evaluation.
- The historical script library and the radio drama library were evaluated as valuable. They are now accessible for the public with the help of conventional means.
- The radio drama library is well customized. It contains interesting information about media and the history of literature. This collection will be completely catalogued.
- The evaluation of the sound effects library and the production archive, with its still unknown material, will be continued. The aim is to keep only the important tapes in stock and to catalogue them.
- It is essential to begin with the technical security of the tapes with the recording speed of 76 cm/s.

DEUTSCHLANDRADIO AND ITS ARCHIVES

Marianne Buder, DeutschlandRadio, Berlin

Paper presented at the Radio Sound Archives Committee session during the IASA/FIAT conference in Bogensee 1994

INTRODUCTION

DeutschlandRadio was founded on the January 1st 1994. It is the latest and probably last broadcasting station to be founded under public law in the German Federal Republic. There are two broadcasting houses, one in Berlin and one in Cologne, with two independent programmes. Both stations are to broadcast 'Information and Culture' with integration of the two parts of reunited Germany as the main goal, according to a legal agreement between the German Länder (federal states) and the German government.

BROADCASTING STATIONS OF DEUTSCHLANDRADIO

Three prominent broadcasting stations, two of them with a long tradition, have been joined together to form DeutschlandRadio; RIAS Berlin, Deutschlandfunk (DLF, Cologne) and DS-Kultur (Deutschlandsender Kultur), Berlin. Nearly all the archives from these stations have been taken over by DeutschlandRadio to secure the stocks, although the position and future working condition of all the archives has not been guaranteed or clarified as yet.

RIAS BERLIN

RIAS was founded after World War II in February 1946 by the Americans in Berlin, as a reaction to the East-West conflict, and its main task was to inform listeners in East Germany (GDR). In the second half of the 1980s RIAS 2 was founded as a second programme for younger listeners, but has now become a commercial station, RS2. In addition a new TV station was created RIAS-TV which broadcast several hours daily including a breakfast-TV programme. RIAS TV became part of Deutsche Welle in 1992 and was developed into a TV service for foreign countries.

DEUTSCHLANDFUNK (DLF)

DLF was founded in January 1962 as a reaction of the Federal government to the construction of the Berlin Wall and the closing of the inner German borders by the authorities of the GDR. It was situated in Cologne and its task resembled that of RIAS - to inform listeners in East and West Germany.

DS-KULTUR

DS-Kultur was founded in the GDR after the fall of the Berlin Wall in 1990 at first as a programme of the Funkhaus Berlin. The Funkhaus Berlin ceased existence in 1991 and DS-Kultur operated as an independent station until the end of 1993 after which it was incorporated into DeutschlandRadio.

The orchestras and choirs of RIAS and DS-Kultur have all been merged into the ROC (Rundfunk Orchester und Chöre) GmbH.

ARCHIVES

Archives from the different broadcasting stations have been transferred to several new locations.

RIAS

All RIAS archives have been incorporated into DeutschlandRadio Berlin. These archives were founded at the time RIAS was established and their stock extends back to 1946 or earlier.

The sound archives contain about 175,000 sound carriers (compact discs, LPs, some singles, commercial tapes, tape copies and a collection of shellac records), all of commercial origin. In addition about 140,000 in-house productions which include spoken word recordings, music productions, concerts of the RIAS orchestras and the Berlin Philharmonic Orchestra and some historic recordings from festivals such as Salzburg and Bayreuth. A collection of material from East German radio stations (MONITOR) and a collection of items with political content from RIAS which is used intensively by all the German broadcasting stations. A collection of sound effects is also maintained, plus a manuscript collection of material related to the sound archives. There are further collections of news clippings, books, music and photographs.

DLF - ARCHIVES

The library and information office of the broadcasting house in Cologne were transferred to Deutsche Welle by July 1st 1993, comprising a sound archive of 110,000 tapes of music productions, 28,000 spoken word materials, 76,000 compact discs and 76,000 records, plus sound effects and sheet music.

DS-KULTUR BERLIN

All 1990-1991 stocks of DS-Kultur were transferred to DRA (Deutsches Rundfunkarchiv). In 1992/93 the DS-Kultur archives comprised two archive departments: sound archives and the information office. DeutschlandRadio has incorporated the word and music productions and the compact disc collection as well as the news clippings, books and central reference collections. The large archives of sheet music of the Funkhaus Berlin are also part of the DeutschlandRadio.

FUTURE

Planning for the future of DeutschlandRadio archives is based on the fact that the existing archives are used intensively and this is likely to remain the case as the broadcasting stations depend on archive materials and information. The aim has to be to increase the use and usability of these archives to maintain their viability, and this depends essentially on the quality of work of the archivists and documentalists.

TECHNICAL

DIGITAL AUDIO IN ARCHIVES

Ian Gilmour, National Film and Sound Archive, Canberra

Paper presented to the ASRA Conference in Canberra 1994

With the recent profusion of digital recording technology and with the demise of analog a matter of 'when' rather than 'if', it is a good time to take stock of what digital formats are around, what is being developed, and reassess where we are heading. Table 1 shows some of the major analog, digital and computer data formats, past and present.

In order to determine the most appropriate technology for archives we must weigh up what we need from recording media and formats, and reappraise some fundamental strategic issues. In this article typical characteristics of several major formats are compared.

Analog Disc	Analog Tape/Wire	Digital Disc	Digital Tape	Computer Disc	Computer Tape
78 Shellac	Wire		PCM F1/701	Magnetic Disc	½", ¼"
Transcript'n	¼" Full Track 15 ips	CD-A	DASH	CD-ROM	8mm
Lacquer	¼ Track	CD-R	DAT	WORM Disc	4mm/DDS
LP/45	Compact Cassette	Minidisc	DCC	Magneto Optical	ID-1
		PCM 9000	PCM 1630		

Table 1: Analog, Digital and Computer Data formats. Professional formats shaded. 

DIGITAL AUDIO - IMPORTANT CRITERIA AND DESIRABLE CHARACTERISTICS

- * Recordability - Will the medium be actively used for:
 - live recording where levels vary widely and there are no second chances;
 - for dubbing or editing of damaged material for preservation;
 - in production where some sections may need to be erased and recorded over;
 - or should it simply provide a durable and non-erasable client access medium for dubbing material neatly from start to finish once all the levels, filtering and editing are set up?

- * Audio Performance - How do the various formats compare?
 - Are there any differences now that digital recording technology is so widespread or is sound quality a dead issue? Just as fundamental are questions of standards.
 - What are the minimum specifications for recording or dubbing material in archives?
 - What are the thresholds used to define useful end of life?
 - Is there a standard data protocol for digital audio exchange which can be transported to future generations efficiently and without losses in quality (preservation by cloning).
- * Stability - for how long can we reproduce the recording without loss or degradation?
 - Medium - chemical and physical survival, fragility
 - Format - compatibility, standardisation and industry support
- * Accessibility - Speed of retrieval, file seek time, transfer rate, networking and interfacing.
- * Size/Capacity - How much will each carrier hold? How much space do they take up?
- * Cost - Machinery (Hardware), Consumables (Firmware), storage, transfer etc.

RECORDABILITY

We tend to categorise recordings as either recordable (eg magnetic tape) or fixed (eg moulded 78 or LP disc pressings). Moulded cylinders and discs have provided affordable copies of music and sound for the mass market for many years. Some form of discs will probably continue to do so for some time. Moulded discs are usually quite stable on account of the heat and pressure used to form them, unlike many of the mechanically and magnetically permeable counterparts which can be recorded (ie. wax cylinders, lacquer discs, magnetic tape).

Cost is also a factor. Large numbers of discs can be simply stamped out using moulds from one original master recording but 500-1000 have to be made before economy of scale is achieved. Cassette tapes have to be separately duplicated. Any quantity can be dubbed but even with high speed duplication a lot more time and resources are needed than for discs. Tapes must be manufactured in one plant then distributed, usually in bulk (pancake) form to duplicators. Discs are manufactured with their recorded content in one process. With the establishment of factories for moulding CDs for audio (CD-A), computer data (CD-ROM) and other applications it has become much cheaper to mass produce laser optical discs of many varieties. Prerecorded minidisks use the same basic manufacturing techniques as CDs, and with a bit of adaptation the same technology can be used for recordable dye-polymer CDs (CD-R), magneto-optical discs (MODs) for computer data storage, and blank Minidisks (MD) for music or data.

Not only are some formats recordable and others fixed, the level of recordability varies. Magnetic discs, tapes and normal magneto-optical discs can be erased and rewritten, recordable CDs and WORM discs (write once, read many times) can only be recorded once but not erased or edited. If a mistake is made the fault may be skipped, reducing the remaining capacity, or the whole disc thrown away. Table 2 summarises the major formats as non-recordable, recordable/non-erasable or erasable/rewritable.

Play only	Recordable	Erasable
78 Shellac	Wax Cylinder	Analog Wire,tape,cassette
Transcription	Lacquer disc	Digital tape & cassette:
LP/45	WORM disc	PCM F1/701/501, DAT, DCC
CD-A	CD-R	DASH/PD, PCM 1630, ID-1
Prerecorded Minidisc		MOD, Minidisc, PCM 9000*
		Hard Disk, RAM

Table 2: Recordability

To make life more interesting, the capability for erasing or editing varies within media types. While normal MODs can be erased by applying the write laser continuously in the presence of a fixed magnetic field to return the disc's surface orientation to its original state in a separate cycle which takes about 20 minutes, the Master Disc format (highlighted*) can be directly overwritten by new data from a fast response magnetic head as the laser is fired. This permits insert editing in read-modify-write (RMW) mode, and allows synchronous overdubbing capability. It is important therefore to assess the need for recordability or editing in any archival application.

AUDIO PERFORMANCE

Frequency Response

Dynamic Range - 16 bits or more, super bit mapping (SBM)

Uniformity - error rate

Timebase Stability

Negligible Wow and Flutter

Fidelity/Distortion

Analog: High level = high distortion;

Digital: High level = low distortion, but low level or over maximum = high distortion;

Sound recording quality has steadily increased since the earliest days, sometimes in small increments, sometimes in quantum leaps. Its evolutionary path was fraught with confusion and controversy just as we experience with new developments today. The introduction of electrical recording in 1925 was met with as much scepticism as the introduction of digital recording over 50 years later. The advent of stereo and microgroove recordings for the mass market was characterised by different companies pushing different standards.

If we examine typical specifications for the major formats which have evolved over time, an important trend emerges (refer to graph - Audio Performance. Percentages have been converted to dB equivalents for comparison i.e. 50% = -6 dB). For a brief period in the 1980s, consumer and professional formats reached a plateau in sound quality. 16 bit PCM at 44.1kHz was hailed by many as a universal benchmark capable of capturing all the subtleties of live performance and of exceeding the limits of any conceivable end-use environment. Many professional engineers were forced back to basics to rethink their microphone techniques and replace most of their recording and production facilities. State of the art .25" analog master tapes were no longer considered good enough for mastering CDs.

Although the bounds of professional audio recording and production were stretched by the introduction of CDs in the early 1980s, a divergence is occurring once again between professional and consumer or domestic formats in the 1990s. Complaints have been expressed about the "edginess", coldness or lack of life in digital recordings. 16 bit quantisation offering a theoretical 96 dB of dynamic range is criticised as being inadequate for capturing all the highs and lows of a concert. Even moderately priced CD players offer 18 bit digital to analog (D/A) conversion with oversampling. 20 or 24 bit is now considered essential to allow recording from live sources, processing or mixdown of 48 track session recordings. Analog microphones which rely on careful gain control to balance the acoustic energy from the real world with the capabilities of recording systems, will soon be replaced by digital microphones which must be able to assign discrete numerical values for every possible level of sound pressure over a range of over 120 dB from less than a whisper to the threshold of pain.

At the same time, pressures of cost, size and distribution have forced a rethink of formats for mass marketing. Manufacturers realised that digitised audio does not always use all of the available data capacity of the system as efficiently as possible. A repetitive waveform doesn't have to be fully encoded every time it occurs. It may be properly digitised once and a small amount of data used to describe when it occurs and if there are slight changes from one occurrence to the next. Passages of silence or very low levels don't need as much data to describe them as complex waveforms with a great variety of fluctuations. By taking advantage of how we hear things and how we can be fooled, manufacturers can save a lot of data. These psychoacoustic phenomena include spectral and temporal masking i.e. we do not notice faint sounds in the presence of louder ones occurring at a similar time and frequency.

While such trickery may work sufficiently well to fool most of the people most of the time in end use applications such as music sales for portable consumer formats, or digital audio broadcasting (DAB), it is important to remember that the part of the signal which is discarded cannot be put back should the need arise. There are many instances where the loss of data prevents or corrupts any further processing. Simple level changes or equalisation may drastically alter the acoustic foundations on which the data reduction algorithms worked. A signal that has been passed through one coding and decoding system (codec) may start to fall apart when put through another different codec. What happens on a straight dub of an old 78 with lots of clicks, crackles and hiss masking other sounds on the original if the surface noise is subsequently filtered out? That is why archives are not rushing in to convert all their heritage into reduced bit-rate formats and it is for these reasons that IASA has ruled out bit rate reduction for preservation.

An interesting sideline to all this is the trend for major hardware vendors, Sony and Philips to offer deals to leading independent studios to produce material for their respective formats, MD and DCC. Typically they will offer free use of encoders at the recording and mastering studios to involve artists and producers in the process at an earlier stage to compensate for the effects of data reduction as material is fed in. As an evolution of our earlier moral - if you're going to fool most of the people most of the time, you first have to fool yourself. (Figure 1 refers)

LIFESPAN OF MEDIUM

We have already gained experience with traditional formats such as moulded discs and cylinders lasting for several decades or even a century with only minimal losses in sound quality. Wax cylinders and lacquer discs or "acetates" are a different story. Magnetic tape has shown variable stability over the last 45 years since its widespread introduction. Ironically some of the older formulations have survived the best. The processes of decomposition are fairly well understood, at least to the point where we can target the most vulnerable ones and optimise storage conditions. Digital tapes usually share the same potential instability in the binder layer, but use thinner substrates and higher coercivity magnetic particles with a few added complications of their own. The first decade of experience with moulded CDs suggests that they can last for many decades provided that they are properly manufactured; and we all know of many that were not. Preservation prospects of magneto-optical technology are potentially greater than for either magnetic particle tapes with binders or recordable dye-polymer CDs, although the severity of media failure or errors in a compressed data format must lead to increased risk.

An important distinction with all digital formats, however is that the mode of failure will ultimately manifest in a different way to analog recordings. The progressive loss of sound quality in many analog systems can be contrasted with the often sudden and catastrophic failure of many digital media. Part of the solution to this problem is to take advantage of the inherent characteristic of digital data, that it can be automatically monitored to predict the onset of failure, and to take action before disaster strikes.

This leads to questions of how readily we can monitor and clone these recordings, and how to define safe margins of performance. Systems for storing complex, random or unpredictable computer data have lower error thresholds than those of dedicated audio systems which can rely on interpolation of small errors in predictable waveforms. Because of this, if we conduct accelerated aging on a MOD for computer data, failure will be based on an error rate 5×10^{-5} whereas a similar disc used for uncompressed audio data will tolerate roughly an order of magnitude greater error. Reduction of bit rates can increase vulnerability to errors. Until we can obtain reliable data or conduct our own tests, we must base our calculations on the 'worst case' suppliers reports, which naturally tend to be optimistic.

A few obvious distinctions can still be made between non-contact systems such as CD and MOD which don't wear out during playback, and tapes which are subject to abrasion from heads and guides, as well as the usual physical deformation/packing problems and magnetic particle/binder deterioration (see Figure 2)

Audio Performance

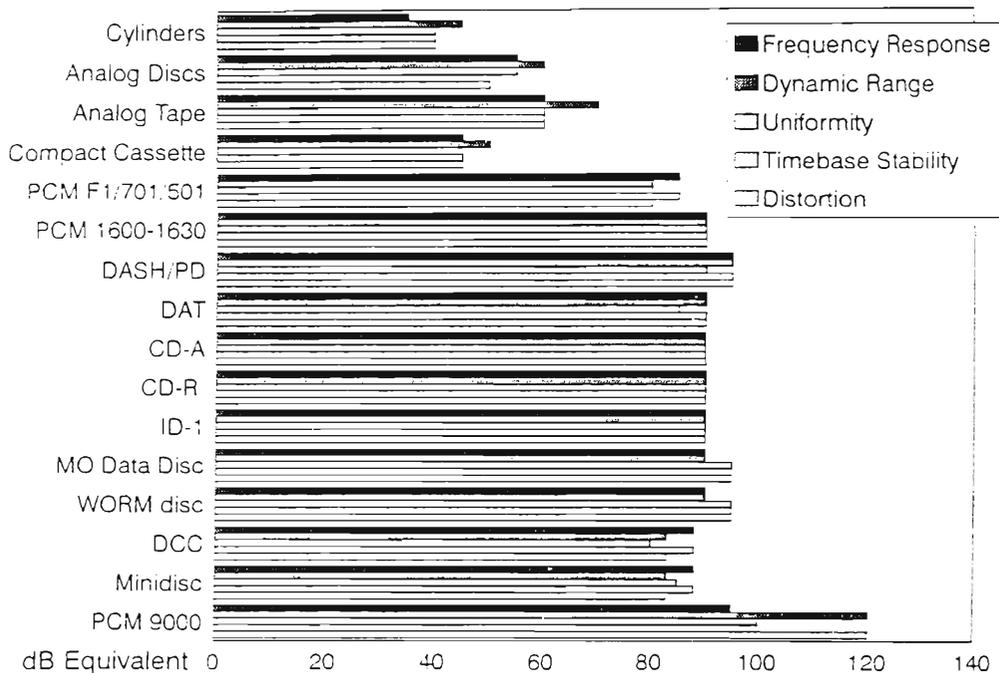


Figure 1

Lifespan of Medium

Typical Stability/Robustness

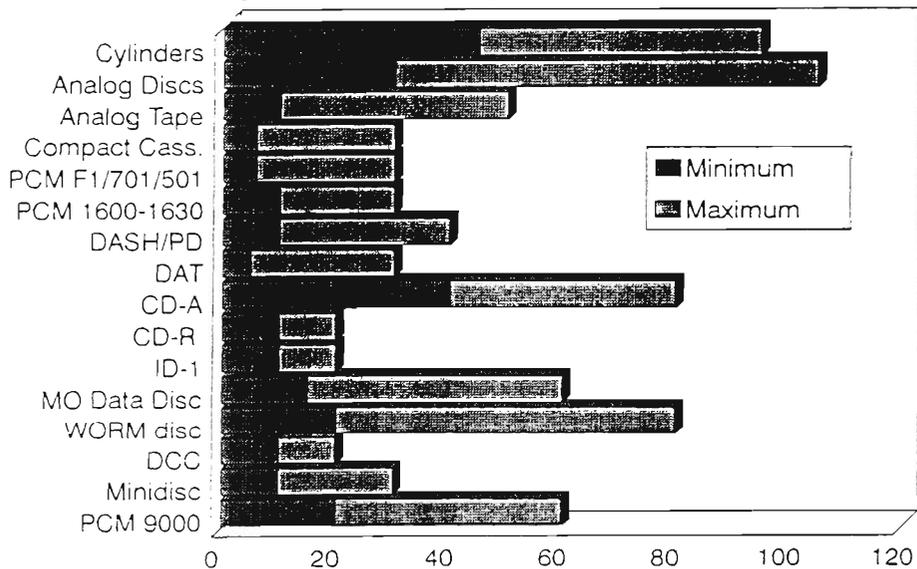


Figure 2

FORMAT STABILITY

According to sales of consumer formats, CDs are assured of a reasonable degree of support by virtue of a large installed base of replay systems and private collections. Like LPs and 78s before them, CDs are likely to be supported by large scale availability of playback equipment for several decades. Vinyl and earlier pressings may be chemically stable, but are now becoming increasingly problematic to rely upon as a preservation medium because of the uncertain availability of stylus assemblies. Archives will require a rigorous strategy to deal with format obsolescence of analog discs, including supply and storage of replacement parts and documentation. CDs may have similar problems in 30 years but at a higher level of technology.

A cornerstone of format standardisation and compatibility was provided by CD mastering. Unlike professional systems for other applications such as DASH, PD or ID-1, PCM 1630 systems are tied to the manufacturing plants, and have the support of key players in the industry as a result. Although a greater range of mastering systems is now available, factories do not tend to reconfigure their mastering systems often, so a certain degree of stability is assured (See Figures 3 and 4)

Consumer Formats

Worldwide Recording Sales

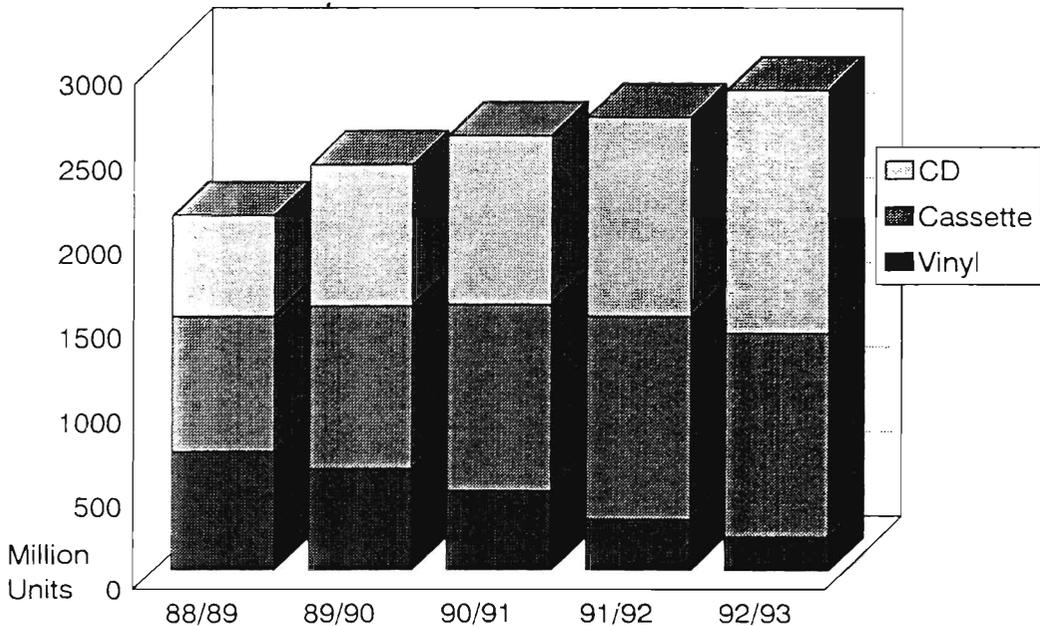


Figure 3

Blank Media Sales

1993/94

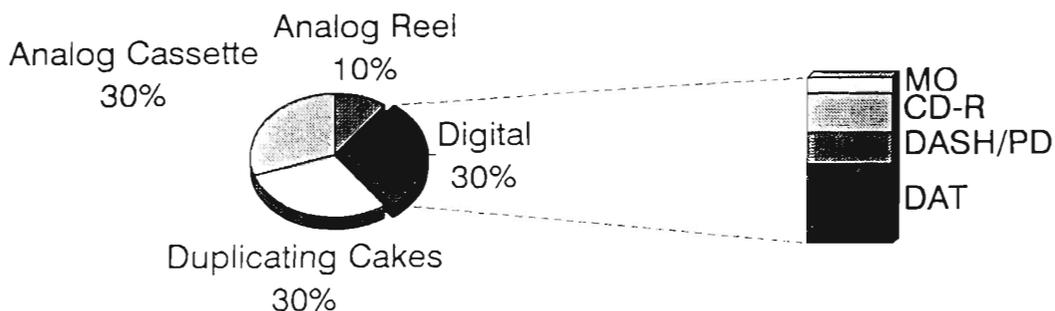


Figure 4

SPEED

Speed of operation has two distinct aspects in relation to archiving and using audio generally. The average seek time, or time required to search and recover files on a disc or tape is an important aspect of performance, particularly in areas such as editing and client access. In this regard discs will always be considerably faster than tapes as the entire surface is always available for scanning, and in the case of digital formats addresses can usually be located just as easily in search mode as they are during sequential playback. Automated systems can typically retrieve and load a carrier in under 10 seconds, regardless of whether it is tape or disc based.

Another aspect of operational speed which has taken on a particular significance in archiving digitally is sustained transfer rate. If we rely on cloning digital data without generation loss, rather than depending upon the survival of individual media, the time and resources taken for cloning is critical. Most data based systems offer rates from 2 to over 8 times normal playback rates. With ID-1 systems the content of a CD could be cloned in several minutes.

By far the fastest storage media are solid-state RAM (random access memory) followed by hard disk drives. Both are used in partnership in digital recording and editing workstations, and in networked mass storage systems where volatile RAM with access times under 100 nanoseconds complements hard disks of around 10 milliseconds seek time, buffering fragmented bursts of high speed data to reassemble different files into smooth, continuous delivery. The high cost and low storage density preclude such technology from use for long-term storage. (Figure 5 and 6)

Speed of Access

Carrier/File Seek Time

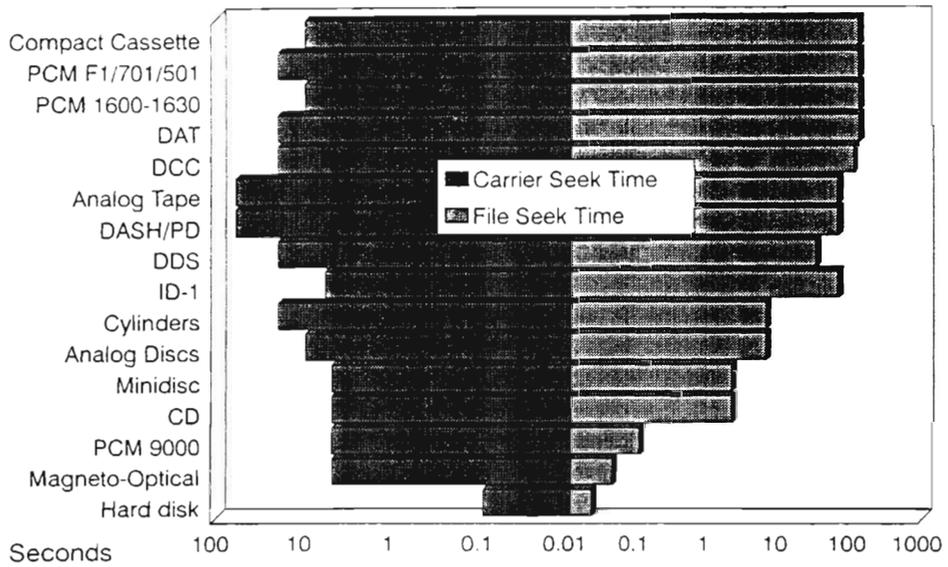


Figure 5

Speed

Access Time/Transfer Rate

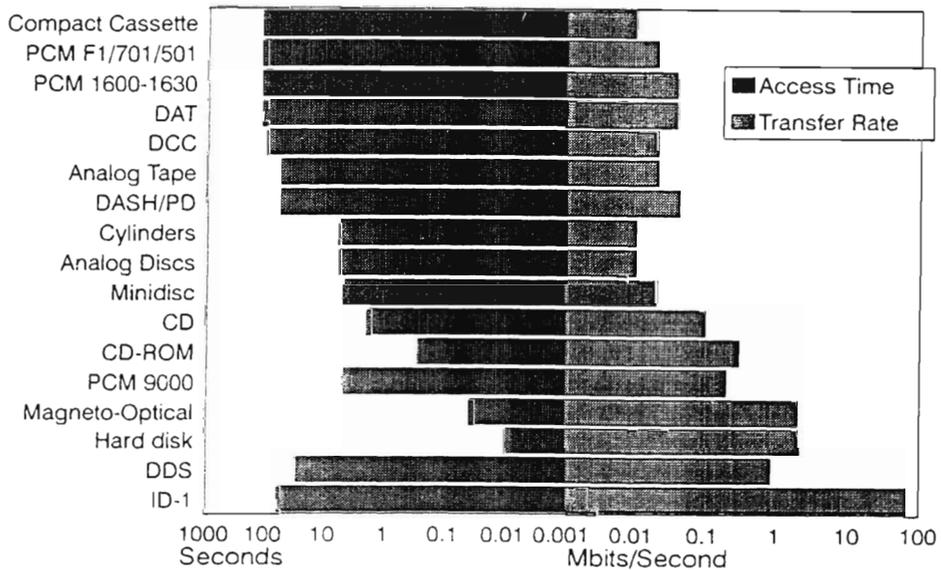


Figure 6

STORAGE CAPACITY AND DENSITY

The ultimate costs of a particular format depend partly on capacity and storage density, due to the expenses of real estate and energy. It is in this area that high density tape and optical disc formats excel. An interesting comparison can be made between reduced bit rate formats and similar formats using full bandwidth PCM data. CDs hold at least 4 times as much data as Minidiscs but in typical storage, using racks or shelves of divided drawers, CDs take up less than 50% more space. DATs hold roughly 8 times as much data as DCC but actually occupy less space. (Figures 7 and 8)

Storage Capacity

Typical Duration per Carrier

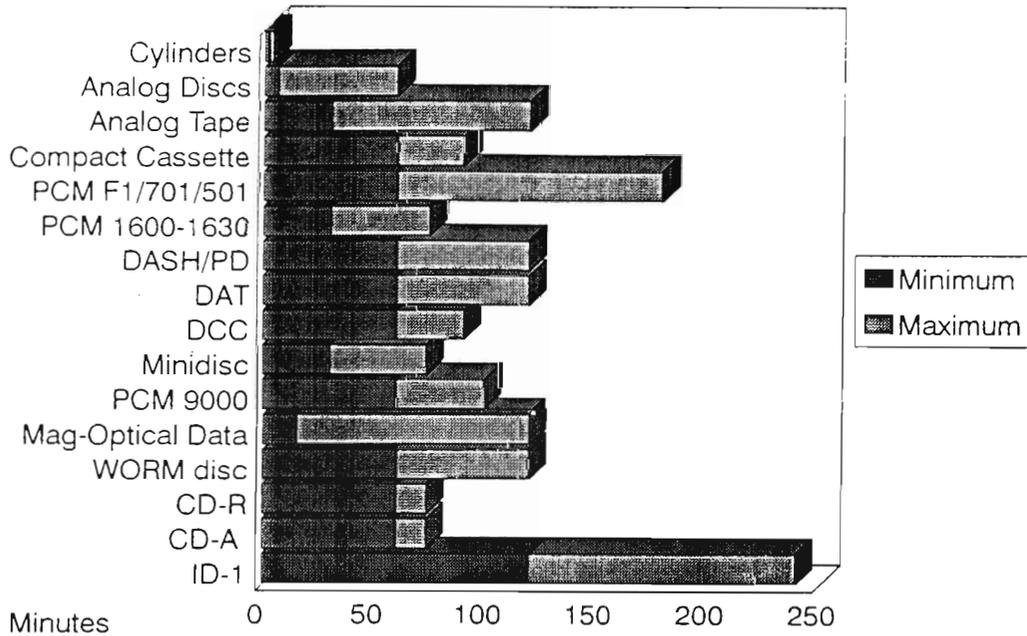


Figure 7

Storage Density

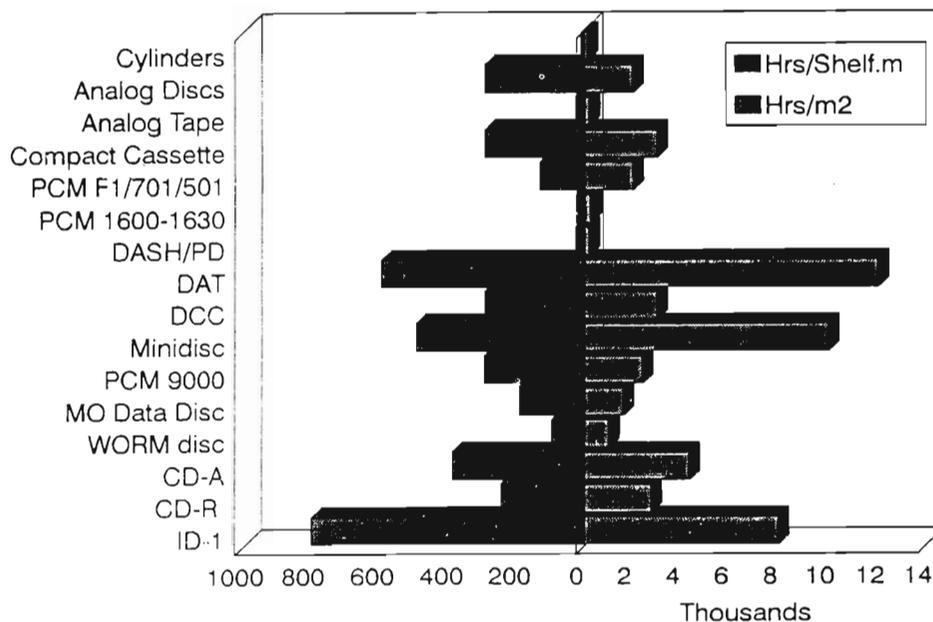


Figure 8

MACHINE COSTS

In these times of clever technology cost is more a question of what can be transferred from metal and plastic to silicon, and in how large a volume. Rather than building machines with powerful motors or solid, accurate tape paths, it is expedient to build flimsy mechanical parts with smart electronic servos and tracking controls. It is an increasing trend to find electronic rather than mechanical solutions. This is particularly true of consumer formats where large manufacturing runs are essential to keep down development and tooling costs of large scale integrated circuits. The unfortunate ramifications for professional users are that consumer formats can often achieve far greater economy of scale, leading to disproportionate pricing disparities between professional and consumer equipment. The close links between audio and data formats such as CD/CD-ROM and DAT/DDS-4mm further enhance the economy of scale and standardisation compared to dedicated formats for audio only.

In an archive we must weigh up how many machines will be needed over the lifespan of a format; how many recorders for preservation recording and dubbing (usually professional models) and how many players for access and clients services. Recorders have to be maintained within rigorous specifications over the currency of the medium for preservation. They may be retained in 'playback only' mode for dubbing after the medium is phased out of active operation. Recorders and players may be virtually the same, as with most tape formats, or recorders may be considerably more expensive, as is the case for CDs (especially moulded ones). A complete system in an archive may also be based on several independent recorders and players in different studios, work areas and public spaces, or a smaller number of centralised or networked machines with suitable control and buffering. (Figures 9 and 10)

Recorder/Player

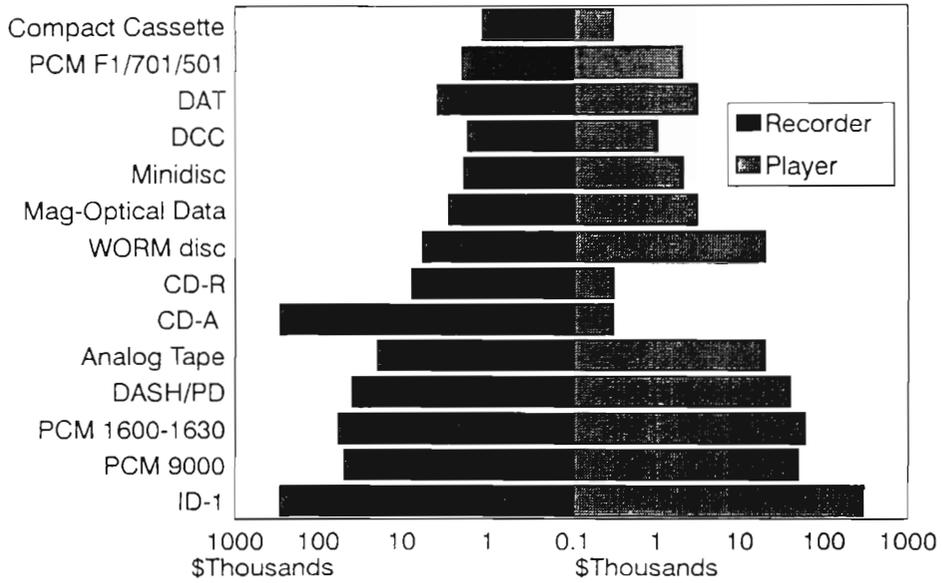


Figure 9

Cost

Machine/Medium

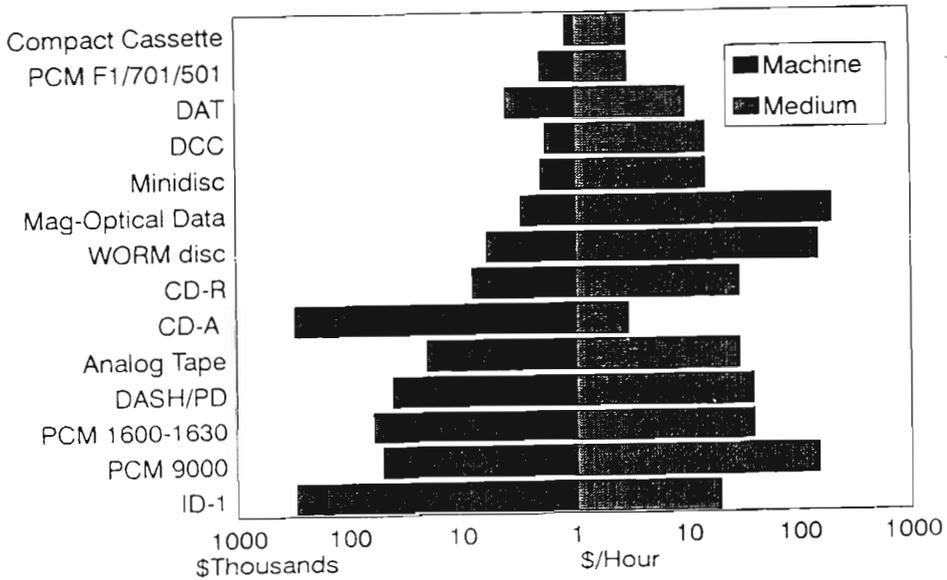


Figure 10

STRATEGIES FOR THE FUTURE - A SYSTEM APPROACH

No single format or medium satisfies all the conflicting requirements of an archive. Different applications have different requirements. The performance criteria will vary according to end use. For client auditioning services we may want rapid access on a familiar, universally accepted medium, or one which can be networked on-line. Absolute sound quality may not be as critical for auditioning by researchers in certain applications, but it is vital for preservation or when dubbing for productions. For long term preservation we may rate stability of the medium and format or clonability (transfer rate and standardisation of data) ahead of seek time.

Access formats require speed and useability (discs: CD-A, CD-R or MD). For networking, CDs with a data-equivalent capacity of 680 Mb or 5 " MO discs (1.3 Gb) offer a far greater capacity than Minidisks in either dedicated audio format or in XMA data format. In data terms, CDs and MODs offer a choice of tradeoffs between sound quality and capacity or density limited only by availability of software companders (compression/expansion algorithms) ranging from pure 16-bit 44k1 (Philips "red-book" standard) CDs and Sony 24-bit MO Master discs to heavily compressed, grainy, narrow-band CD-ROMs bordering on unintelligibility. If the market opportunity exists, mass-produced, moulded CDs are unquestionably the most economical means of providing large numbers of high quality copies for clients. Of the recordable formats for limited numbers of copies, the choice comes down to CD-R or slightly cheaper Minidisks with reduced bandwidth.

For mastering CDs and other mass market formats, the PCM 9000 MO Master Disc format is targeted to replace PCM 1630s as the new professional standard. The access speed of discs is further enhanced by inbuilt address and timing tracks, as well as capability for playlist editing on one machine. Reordering of tracks is done just by reading out the data in a different order, rather than having to dub a new version onto another tape. Machine costs are the same as or lower than DASH, PD or 1630. Several other tape and disc formats are also geared for mastering, however.

For preservation several considerations apply. Backup and redundancy do not rely solely on one medium or format. For the medium term, .25" analog tape and at least one standard 16-bit digital copy will safeguard against loss of content. Standard, full bandwidth digital audio can be cloned from DAT or CD, unlike reduced bit rate formats. Analog, for all its measurable flaws which multiply over generations of copies, has a proven record and is far more easily reconstituted.

Investigation and testing into stability of tape, DAT, CD, CD-R, MO and WORM discs must continue. Digital formats need ongoing research into market surveillance industry support. Once modes of failure are known, risks can be minimised through appropriate storage, handling and collection monitoring. For digital formats particularly we must develop more automated, streamlined error analysis capability so that deterioration can be detected at an early stage, in time to copy the data without losses. Format obsolescence strategies must be implemented for conventional analog discs and tape covering machinery, replacement parts and operational and service information.

The solution needed is a total package of appropriate technology, work practices, methodology, collection management and information which will ensure the ongoing survival and accessibility of material.

SUMMARY

CD - Moulded

Universal Standard: 44.1kHz 16-bit PCM; wide market acceptance
High stability glass master
Multiple copy redundancy
Low unit cost, high initial outlay: cost-recovery or revenue; popular' content only
Rapid access, seek time

CD-R

Universal Standard: 44.1kHz 16-bit PCM
Preservation prospects uncertain: dye-polymer layer; damage to 'one-off' copy
Moderate unit cost
Non-erasable
Rapid access, seek time

Mini Disc

New domestic 'standard': ATRAC data reduction
Low unit cost
Erasable
Rapid access

DCC

New domestic 'standard': MPEG 1 data reduction
Preservation prospects uncertain; magnetic/binder layer
Low unit cost
Erasable
Slow access

DAT

Established Standard: 44.1/48kHz 16-bit PCM
Preservation prospects uncertain: magnetic/binder layer
Low unit cost
Erasable, editable
Slow access

MO Master Disc

Compatible data format: 44.1/48kHz 16-24 bit PCM
Preservation prospects improved - magneto-optical
Higher unit & machine cost
Erasable, editable

TECHNICAL

INTRODUCTION

Albrecht Häfner, Südwestfunk, Baden-Baden

Papers presented at the Technical session during the IASA/FIAT Conference in Bogensee 1994

The contributions are dedicated to a series of themes which the Technical Committee has dealt with already in Canberra and Helsinki: the digitisation and storage of large amounts of audio (as well as video) signals and the reasons for these options. I strongly believe that these subjects are currently very pertinent, and that realistic solutions are in sight.

There are some good reasons to reflect more and more upon digitisation within the AV archives. The most important one no doubt is the safeguarding of the holdings. Conventional AV carriers are threatened from the inside (by deterioration, degradation, decay etc.) as well as from outside (by fire, water, etc). The most dangerous side of this threat is its incalculability of occurrence, and the fact that the probability of occurrence increases according to the age of the av carriers, should be alarming. If therefore the archivist does not begin to act, then he will risk reproach for his irresponsibility tomorrow.

This is the background to the following series of papers; they aim to show the gigantic amount of audio and video material in existence all over the world, some of the dangers which threaten them and an approach of how to strategically solve that challenge by means of digital techniques, preferably by digital mass storage systems. Finally the representatives of two big companies, which are able to offer suitable systems on the market, will outline their research and product.

AUDIO, FILM, AND VIDEO SURVEY

Gerald D Gibson, Library of Congress, Washington DC

Paper presented at the Technical session during the IASA/FIAT conference in Bogense 1994

This report presents the results of a mail survey of organizations that archive audio, motion picture film, and video. Carried out by the Library of Congress in conjunction with the Technical Coordinating Committee of the Round Table on Audiovisual Records¹ and the International Council of Multi-Media Users (ICMU). Funds to cover the costs of the mailing and to give assistance to carry out the survey and compile the data were provided by the Eastman Kodak Co. The assistance funded by Kodak was provided by National Research Inc., a Washington, D.C., firm chosen by and working for the Library of Congress. The primary purpose of the survey was to gather current information on the size and scope of audio and moving-image carriers in public non-profit, governmental, educational, and/or commercial archives.

METHODOLOGY

Five hundred (500) questionnaires were mailed in April 1993 by the Library of Congress to commercial and cultural institutions that are involved in archiving audio and moving-image media. The recipients of the questionnaire were chosen from a wide range of sources: membership directories of members and affiliates of the NGO Roundtable and ICMU, commercial directories, et al. The replies were received by Gerald Gibson and, after review to make sure that none of the information provided was shared under a request of confidentiality, taken to National Research Inc. for processing. The survey was initially to be closed in early summer 1993. Unfortunately, the response rate at that time was very low and it was decided to extend the closing date to the beginning of August '93 at the same time that fax and post card reminders were sent to those who had not returned their questionnaire.

By the end of August 1993 a total of 202 (40.4% coverage) questionnaires had been accounted for: 159 (31.8%) providing useful data; 15 (0.01%) providing data that could not be translated into useable details; and 28 (5.6%) returned with undeliverable addresses. The report which follows is based upon the 159 (31.8% response rate) useable responses.

Because of the problems inherent in self-administered surveys and the relatively low response rate (202 of 500 questionnaires returned, but only 159 containing substantive responses), caution must be used in projecting these results to the larger population of audio and moving-image archives.

TOTAL HOLDINGS

The 159 responses accounted² for 29,806,448 items (23,660,379 audio recordings; 3,214,512 film reels; and 2,931,587 video recordings), or an average of 187,462 items for each of the 159 substantive responses. This further averages out to 48,807 audio

recordings; 20,217 film reels; 18,438 video recordings for each of these. If these averages can be extrapolated to the 500 collections to whom forms were mailed it would total 93,731,000 items (74,403,500 sound recordings; 10,108,500 reels of film; and 9,219,000 video recordings). I will leave it to the statisticians among us to determine the validity of such projections.

TYPES OF INSTITUTIONS AND HOLDINGS

Most (143, or 90%) of the organizations who responded described themselves as either governmental, non-profit, or educational institutions. Only a handful (16, or 10%) are self-described as commercial organizations.

The most common form of media held is audio, with 129 (81%) of the respondents reporting sound recordings. This is followed by video (107, or 67%), and then motion picture film (84, or 53%). Commercial organizations are somewhat more likely than others to hold motion picture film, while educational institutions report a higher level of sound carriers.

MOTION PICTURE FILM COLLECTIONS

The most commonly held film format is 16mm, with four-out-of-five (68) respondents citing this carrier. The next most commonly held film media is 35mm b&w safety film, then 35mm colour safety film. Only one third of those responding (28) report holding nitrate film.

The most commonly held motion picture sound element is 16mm magnetic film, followed by 16mm and 35mm safety optical sound tracks. One-quarter (21) hold 35mm magnetic film and .25" magnetic tape motion picture sound track. Only 12% (9) hold 35mm nitrate optical sound tracks, and 5% (5) have vitaphone-type discs.

Among other film formats, 8mm and S8 are held by 35% (11). Only one-in-five (17) report holding 70mm film, and even fewer have holdings in either 9.5mm or 28mm formats.

In terms of the make-up of the film holdings, most respondents have between 50% and 99% of their collection in archive copies, have less than 50% of their collection made-up of reference/projection prints, and less than 25% of their holdings in distribution/lending copies. Four-out-of-five (68) have less than 25% of their collection in B&W separations, with 38% (27) having none of their holdings in this form.

A plurality (39%, 33) of institutions with motion-picture film collections have annual budgets under \$50,000 for film preservation and conservation. Just one-third (27) have annual budgets between \$50,000 and \$499,999, and only 16% (13) have budgets above \$500,000 for these functions.

Few anticipate funding changes in their film preservation and conservation budgets. A plurality (32%, or 27) do not anticipate a change in their funding for 1993-94, and one-quarter (21) of the respondents did not answer the question on funding change. Among those who anticipate an increase in funding, an increase of 5% or more is the

most common. Similarly, among those who foresee a decrease, 5% or more is the most frequently cited percentage.

Overall, of the 84 film archives responding to the questionnaire the average number of film-to-film titles copied annually is 104.17 (or a total of 8,750.28 titles copied annually), the average number of reels copied annually per collection is 381.93 (32,082.12 reels copied annually), and the average annual footage copied is 283,548 (23,818,032 feet copied annually). However, between 50% and 60% of the respondents either chose not to respond to this question, do not know how much film-to-film copying is done on their holdings each year, do not copy film-to-film at all, or chose to leave it blank for other reasons.

Commercial and governmental institutions are far more likely to copy film-to-film than are public, non-profit, and educational organizations. However, few institutions make film-to-film preservation copies in-house, or accept work from other institutions. Similarly, only a very small handful of organizations are digitally converting film collections, or are making their collections available via electronic means. However, commercial organizations are the most likely to undertake either one of these efforts.

VIDEO FORMAT COLLECTIONS

The most commonly held video format is the .5" cassette, with 85% (110) acknowledging holding them. This is followed by 3/4" cassettes, held by 75% (97) of the respondents; 1" open reel, held by 51% (66); and .5" and 2" open reels each held by 33%+ (44). Less than one-in-six (21) institutions report holdings video discs; and D-2 digital video is the most common of the three digital video formats, with 11% (14) reporting this media.

Overall, reference copies make-up less than 25% of the collections, and distribution/lending copies are rare --with 66% (85) of the reporting institutions saying this makes up none of their collection. Consequently, a much greater proportion of space in video storage facilities is taken up by archive copies of video than either reference/projection or distribution/lending copies combined.

Concerning the anticipated life of a video tape, close to one-third (31%, or 40) say that they believe the typical lifetime of a video recording is under 20 years. Only 14% (18) say their videos last 20 to 29 years, and 6% (8) say they believe the typical lifetime is 30-39 years. However, nearly half, 49% (63) either do not know or gave no answer to this question. Given this lack of information on life-expectancy it is not surprising that 85% of the respondents (110) either do not have information on copying of their video collections, or, more likely, are not presently making copies of their video holdings.

Budgets for preservation and conservation of video reflect the smaller holdings, the uncertainty of life-expectancy of the media, and the lesser expense for copying video-to-video: budgets for this work are generally under \$49,999 (58%, or 75). Only 36% (46) institutions --the majority being commercial collections-- have video preservation and conservation budgets between \$100,000 and \$499,999; none report budgets over \$500,000.

As with film, the majority of collections anticipate no change in their budgets next year (33% specifically saying 'no change', and 26% giving no answer). Among those anticipating a change, most expect it to be either plus or minus 5%.

Most of the respondents (over 60%, or 78 of the 129 institutions reporting video holdings) either do not make video-to-video copies, or do not know how many such copies are made annually. Among those reporting video-to-video copying, the average number of titles copied is 586.26, or a total of 29,899.26 titles copied per year; there are an average 1,194 video-to-video items copied per year, or 60,894 total items reported per year; and an average of 29,982 video-to-video minutes, or a total of 1,529,082 minutes, 25,484.7 hours.

40% (52) of the institutions reporting holding video make video-to-video preservation copies in house, with commercial organizations, again, being more likely to do so than those who report they are primarily non-commercial. Only 17% (22) of the reporting institutions will accept orders for duplication or transfer work from others; with the same proportion (17%, 22 institutions) being involved in converting their video-to-video collections to digital formats.

A surprising 14% (18) of those responding to this questionnaire are involved in making their holdings available via electronic means.

AUDIO FORMAT COLLECTIONS

Of the 143 respondents reporting audio, 102 (71%) hold audiocassettes, 100 (70%) hold LPs, and 60% (86) hold CDs. After these, in order of frequency, holdings are 7" open reel magnetic tapes, 78rpm disks, 45rpm disks, 10.5" open reel magnetic tapes, 5" magnetic tapes, 12" acetate disks, and wax cylinders. Other audio media (16" vinyl disks, 10" acetate disks, 16" acetate disks, celluloid cylinders, mechanical instrument rolls, wires, and music box discs) are more rare, with less than 20% (29) of the respondents holding one or more of these media.

Almost 25% of all respondents (35) report having only or predominantly archive copies (25% have from 75% to 99% of their holdings made up of archival copies; 17% report between 50% and 74% of holdings being in this category). Three-in-five (86) say less than 25% of their collection is comprised of either reference or lending copies. Consequently, most respondents say that their storage facilities are occupied by archive audio materials, with reference and lending copies occupying a far smaller percentage of their storage space.

According to these 143 respondents, the typical lifetime of an audio magnetic recording is between 20 and 39 years (32%, or 46 of the replies). Another 14% (20 replies) say their magnetic media lasts between 40 and 49 years, with 46% either not responding or stating they do not have adequate information to make a projection of such life-expectancies. Very few audio archives have ongoing programs to duplicate their magnetic holdings (only 17%, or 24), with the most common interval for those with such programs being six years or more.

51% (73) have audio preservation and conservation budgets under \$50,000 per year (this is particularly true of educational institutions, with 80% of them reporting budgets in this range). 25% (36 of the reporting institution have audio preservation

and conservation budgets in the \$50,000 to \$499,999 range; and only a handful (12%, or 17) have annual budgets for this work over \$500,000.

Again, there is little anticipation or awareness of either increases or decreases in funding to do such audio related work. Just one-in-five institutions expect an increase in funding, with most projecting their advances at 5% or greater. Slightly fewer (17%, 24) see a decrease in funds for 1993-4, with the two most frequent ranges being 1%-3% or greater than 5%.

A significant number (57%, or 82) of reporting institutions make audio copies in-house; with only 34% (49) accepting orders for transfer work. In-house transfers are only slightly more common among public, non-profit organizations than other types. The reported average number of audio-to-audio transfers per year is 13,532 and an average total time is 59,727 minutes (or a total of 1,150,220 items and 84,613 hours copied in the last reporting year). A surprisingly high 37% (53) of the respondents are involved in some form of digital conversion of their collections, with the majority being public, nonprofit institutions and commercial organizations; few educational collections are undertaking this process. A further surprise is the relatively high 17% (24) who report that they are involved in or are exploring making their holdings available via electronic, long-distance means. As with moving-image data, preliminary views were that this number would have been much lower.

A clear need which emerges from this survey is that audio and moving-image archivists have little idea of just how long their media will last. Another is that there is inadequate information of just how much reformatting is being done for preservation and conservation purposes, though the limited information available is that -though uncoordinated- a great deal of such work is being done.

Finally, while the response to the questionnaire was less than we would have hoped, we are indebted to those who took the time to complete the questionnaire and to provide information essential to give us this look at the state of audio and moving-image preservation throughout the world.

ENDNOTES

1. The Round Table On Audiovisual Records is a forum for the co-ordination of work of the International associations concerned with the archiving of audio and movind-image data: International Association of Sound Archives (IASA), International Council of Archives (ICA), International Federation of Film Archives (FIAF), International Federation of Television Archives (FIAT), and International Federation of Library Associations and Institutions (IFLA).

2. Please note that the figures used here are not the specific numbers reported by the respondents. Some holdings were reported in numbers of items, some in titles etc. rather they are 'translations' of the furnished information based upon the experience of the Library of Congress in converting items to titles to footage/running time.

Tables of holdings and conversion rates for extrapolations are obtainable from Gerald Gibson at the Library of Congress.

STRATEGIES FOR THE SAFEGUARDING OF AUDIO AND VIDEO MATERIALS IN THE LONG TERM

Dietrich Schüller, Österreichische Phonogrammarchiv der Akademie der Wissenschaften, Vienna

Paper presented at the Technical Committee session during the IASA/FIAT Conference in Bogensee 1994

Ever since Pickett and Lemcoe's report (1959), which marked the beginning of systematic approaches towards audio preservation, audio, and later video, archivists have been looking for measures to preserve their holdings in the best possible way - this meant the artifacts: the cylinders, the disks, the tapes. Considerable headache and research has been, and is still, directed towards the question of the life-expectancy of audio and video carriers and the measures necessary to retain their chemical and physical integrity for as long as possible¹.

The crucial problem has always been the fact that audio and video carriers have never really been produced with longevity in mind. They are part of the entertainment industry and are in daily use - both in the private and in the professional domain. The products have proved to be more or less stable enough for the purposes they were originally intended for. Archivists, however, are thinking in different dimensions of time. They had to carry all the burden of preservation including expensive and elaborate research into the stability of the many materials used. There was little systematic support from or co-operation with the producers of tapes and disks. The situation, however, changed gradually during the second half of the eighties as a result of two initiatives:

Members of the Association of Recorded Sound Collections (ARSC) in the United States approached the Audio Engineering Society (AES) to include topics of archival matters in a workshop during the AES Convention in Los Angeles, November 1986. This workshop raised great interest from the side of the audio engineers and brought about a Sub-Committee on Audio Restoration and Preservation within the AES Standards Committee. William D Storm, a member of both ARSC and IASA Technical Committees and the then Director of the Belfer Audio Laboratories and Archives of Syracuse University, was appointed Chairman; the Committee has since met regularly at the fringe of the American AES Conventions². The core of this group consists of audio archivists - members of the Technical Committees of ARSC and IASA - and of interested manufacturers - mainly of tape and tape equipment - who realized that archiving obviously was a yet undiscovered and possibly profitable market.

In parallel, and in close co-operation, with this AES Group, and with several personalities in common, the technical bodies within FIAF, FIAT, IASA and ICA joined forces in 1987 by forming, with the help of UNESCO, the Technical Co-ordinating Committee (TCC). One of its main activities was the organization, with the support of UNESCO, of a dialogue between audiovisual archivists and manufacturers of technical equipment.

In the course of the activities of these groups it became apparent that manufacturers were not aware of the fact that a large part of all professional tapes produced and sold are being kept and put into an archive for at least a mid-term period. The audiovisual archivists, on the other hand, were unable to make any statements on the order of magnitude of their holdings.

In this situation the IASA Technical Committee started a project to provide an estimate of how many hours of recorded audio material is kept worldwide. It was intended to scan the situation in selected countries and to extrapolate from there on the worldwide situation. The results from the United States, Sweden, Austria, and Germany were presented at the IASA Conference in Ottawa 1990. A publication of these results, however, was withheld in view of the proposed worldwide survey by the Library of Congress, the results of which were given in the paper by Gerald D Gibson preceding this article. The idea behind both surveys is the same: it is an attempt to assess the worldwide storage requirements for audiovisual materials and to draw conclusions about the likely future technical and financial requirements for the preservation of the audiovisual materials which have become an important part of the cultural and intellectual heritage of mankind.

In looking at the audio and video domains, the results can be summarized as this: the reported holdings embrace 14 million hours of audio, and 2.7 million hours of video. The worldwide projection of the holdings is 45 million hours of audio and 8.6 million hours of video³. The growth rate of these holdings (and this is known from the IASA TC study) is between 5 and 10 percent per year.

This is an impressive amount of holdings; the preservation of which in the long term raises considerable technical, logistic and financial problems.

In developing possible scenarios for preservation of these holdings into the future, let us first stick to traditional archivist's thinking of safeguarding the artifacts they have in their collections. Lifetime expectancy of the various carriers plays the predominant role in this kind of thinking. It is not the purpose of this paper to go into a lengthy debate but let us assume an average lifetime of 50 years of a carrier - an assumption which will be regarded as over-optimistic by many, especially for some modern formats. Even in this rather optimistic scenario, the transmission of the contents of such carriers over a millennium implies the necessity of 20 generations of subsequent preservation or master copies. If this is done in the analogue domain - and most of our holdings are still analogue - everyone familiar with the audible and visible degradation of signals after only a few generations of copies will agree that such a strategy cannot be called "archival".

It becomes clear that traditional thinking, in its attempts to minimize the shortcomings of the analogue world, is the source for the idea of the "eternal carrier". Though technically possible in the form of metal matrices, this possibility has never succeeded on a large scale because of its enormous costs⁴.

With the advent of digital storage techniques, however, the situation has, in principle, changed radically. In the digital domain it is possible to copy information without any loss from generation to generation. The content of each copy is identical with the original and, most justifiably therefore, the term "cloning" is associated with digital copying. Digital storage offers also another most important feature over the analogue: the integrity of the information can be checked precisely, and, most important, errors - up to a certain threshold - can also be fully corrected.

Many archivists will remember the optimistic view especially audio archivists (including the author) took in the late seventies and early eighties of the digital future. Professional digital formats have been envisaged, accepted as an universal standard, by the late eighties or early nineties. Similar thoughts may have lent wings to our colleagues in the video archives. The market, however, developed differently. Various formats have been developed, none - except the compact disc - has gained universal acceptance so far.

Unlike analogue times, when the consumers were blessed with by-products of a professional market, the digital audio development became driven by the consumer formats rather than the other way round. A good example is R-DAT which was intended to replace the compact cassette and now survives in the professional world.

The video scene is even more complex: six digital formats have been developed so far, none of which is in a dominant position in the market. It is not unrealistic to say that the first digital video formats will become obsolete before they will have gained any sizeable market penetration. This adds another, hitherto unknown, problem to audiovisual preservation: the obsolescence of hardware or - to define it from another side - the physical survival of the software over the economic survival of the hardware. While it is expensive, but still affordable, to construct replay machines for Edison cylinders from scratch using the latest technology and exceeding by far the performance of the historical machines, it is unaffordable if not impossible to rebuild a complex digital audio or video player once mass production has ceased.

Though obsolescence of hardware plays an ever increasing role, emphasis has to be given to the fact that none of the hitherto developed commercially available audio and video formats have been developed with longevity in mind. None of these formats have so far been accepted by the community of archivists as "archival".⁵

In this complex and desperate situation the solution lies in the use of digital mass storage systems for audio and video signals. Such systems would hold audio and video information as computer files. As in the world of "traditional" computers it would be possible record, read and transfer data without necessarily personally handling a physical carrier. The enormous amount of data required by audiovisual information, however, can only be managed adequately by jukebox-like robot systems which automatically load the required data carrying medium. Such systems, of course, are remotely accessible and this feature is of special interest for radio, television, and national audiovisual archives: it would radically improve and dramatically reduce the cost of access to their holdings. Automated access also permits the self-checking of the integrity of the holdings. Without any human intervention a copy (clone) can be made of a carrier found to be at risk of losing information because the error rate is likely to rise beyond full error correction capability. If, after a given time, the system becomes technically outdated, transmigration, ie. the transfer of the total collection into a new system, can also be made automatically.⁶

The first debate on such a scenario in the sound archives world was associated with the author's presentation of the paper "Towards the Automated 'Eternal' Sound Archive" at the Joint Technical Symposium (JTS) in Ottawa, May 1990 (Schüller 1992). This presentation was not generally hailed and several friends expressed scepticism at that time, especially with regard to the authors view, that longevity of carriers of such systems is of minor importance: as lifetime of the system of more than 10-15 years would only unnecessarily freeze outdated technology.

Since then, however, the change of paradigm has been generally accepted: If a considerable part of the audio and video holdings is to be preserved for the future, it is the information that has to be kept rather than the carrier.⁷

Currently, several attempts are made to enter this new domain of audiovisual preservation. Most advanced is the project of the Bundesverband der Deutschen Phonographischen Industrie (Federal Association of the German Phonographic Industry). A Working Group on Archival Systems, of which the author is a member, is currently finalizing the specification of a mass storage system suitable for the requirements of digital multi media management on a large scale. Such systems would be capable of holding several tens of Terabytes.⁸ In addition to the recorded sound, written documents, label and cover layouts, photos and other information associated with the recordings will be stored. The first implementation of such a system is expected for 1995.

Beside this most advanced project, several radio stations, especially within ARD, the community of German radio stations, are considering similar solutions.

There is a noteworthy development with runs parallel to the endeavours of the world of archives: the so-called information or data highways. These new communication tools are associated with video-on-demand, teleshopping, electronic libraries, multi media data banks, etc. All these new and attractive services have a common prerequisite which is not part of the daily discussion: mass storage systems. This convergence will undoubtedly lead to intensive further development of such devices.

Returning to the Library of Congress survey, it is possible for the first time to roughly estimate the worldwide digital storage requirement of audiovisual archives. As film preservation is not yet economically feasible in the digital domain⁹, let us calculate the storage space requirement of the projected worldwide audio and video holdings only:

The result is impressive:

Audio is estimated to require 30 PB

Video, depending on the chosen format, 825-1050 PB or around 1 EB¹⁰.

Even in the unlikely event that only 10% of the worldwide holdings are kept "to eternity", the result is still impressive. Furthermore: photographic stills and film preservation would vastly increase this amount, once more powerful mass storage systems come within financial reach. And, finally, if only the most important recent literature is put into full text data banks, another enormous increase of storage requirement has to be added.

All these requirements are in the immediate future: they will undoubtedly lead to a boom of digital mass storage systems in the very near future. Obviously, there will be various competing systems on the market and in principle there is - as with audio and video formats - the danger of obsolescence of hardware. But there is an aspect which gives cause for optimism: Although some mass storage systems are extremely attractive in terms of costs per stored Byte, the initial investment in hardware is considerable. It is unlikely, therefore, that too many competing systems will turn up, leading to the phenomenon of the obsolescence of hardware as we know it from the

audiovisual formats. The financial sums necessary call for cautious decisions. It can be assumed that the first successfully operating systems will have an influence on subsequent decisions, possibly thus establishing a quasi-standard.

From the high costs of hardware it becomes also clear that small institutions like academic units, etc., which do not hold great amounts of audio and video data, would probably not attempt to take responsibility for the preservation of their holdings themselves. Safeguarding could be passed on to greater, central units which are able to offer professional data storage at economically attractive rates.

The big problem to be solved in the forthcoming years is the question of the transfer of the hitherto accumulated materials in such storage systems. There is as yet no serious estimate on the duration of this transfer but, as a preliminary rough guess, it may be assumed that this procedure may last at least 20 years. This perspective brings the aspect of longevity back into the debate. Undoubtedly the transfer has to be structured according to priorities: frequent demand and endangered original materials will be the most important parameters in setting such priorities. Therefore, research into the life-expectancy of existing carriers and measures to prolong their life are still top issues on the agenda; it would be unwise to start the transfer with relatively stable materials while others rot away.

In summarizing, it must be stressed that all technical prerequisites for a new strategy in audio and video preservation are available. Preservation of the information rather than the carriers is the only feasible solution to preserve in the long term what is considered of archival importance. Undoubtedly, a start into this new era of preservation has to be made soon and the implementation of the first systems is very close.

Notes:

(1) Film was the first audiovisual medium to attract systematic activities towards its preservation. This is most understandable as the cellulose nitrate, which was used as a filmbase until the early fifties, is inherently unstable and extremely flammable. This situation also led to the foundation of FIAF, the Federation Internationale des Archives du Film, as the first audiovisual archives association as early as 1938.

(2) The Subcommittee later also joined forces with ANSI (American National Standards Institute) and formed the Joint Technical Commission AES/ANSI IT9-5 which is actively engaged in working out standards and recommended practices for the preservation, re-recording etc. of audiovisual materials.

(3) The projection made in the study may become a matter of discussion. For the purpose of this paper the author follows this projection as it is the rough order of magnitude which is of interest.

(4) There are few examples where metal masters, mainly of the LP format, have been produced just for preservation purposes. The BBC did so in their earlier days, political events of special importance in the former communist countries have been

preserved in this way, sometimes also most valuable research materials like the historical holdings of the St. Petersburg Phonogrammarchiv.

Durable carriers are also available in parts of the digital world. There are metal masters used in the production of optical discs (CD) and the French manufacturer DIGIPRESS has developed the "Century Disc", a compact disc of tempered glass, with a life expectancy of centuries (cf D Oudard).

It must be stressed, however, that "eternal" carriers also require the "eternal" availability of the required playback equipment.

(5) IASA Technical Committee in reviewing the situation drafted the following resolution, during the Annual Conference in Canberra 1992: "During its meeting at the Canberra IASA/ASRA Conference in September, 1992, the IASA Technical Committee discussed its ongoing review of the progress of digital formats in view of its suitability for archival purposes. Although decided progress has been made, the IASA TC is still not in a position to predict a better life-expectancy for a digital system and format than for the known analogue formats in present use. Hence the recommendation that analogue tape is the preferred master storage medium still has validity. However, archives should actively play a role in the development of digital systems optimized for long-term storage of our cultural heritage" (Minutes of the General Assembly II, Canberra, 29th September 1992).

(6) The idea itself is not new, of course. Ever since the use of computers the very data carriers and their longevity have never played any significant role. We all have personally witnessed, for example, continuous bank services throughout the decades without noticing the many transmigration processes performed on our accounts - from punch cards to various magnetic tape and disk formats - which took place behind the scenes. The difference lies only in the order of magnitude of storage space once audio or, even more, video signals should be stored digitally. This new way of thinking can be traced back to May 1989, when - on the occasion of the 90 anniversary of the Phonogrammarchiv - the Second UNESCO Consultation took place in Vienna.

(7) It has to be recognized, however, that in the case of mass-produced carriers, namely disks, the carrier itself and its associated materials like labels, covers, booklets, etc. are cultural objects worthy of preservation. The preservation of these will be the task of museum-like collections, which undoubtedly will do this in a very selective manner, once the survival of the contents is guaranteed in a quantitatively satisfactory way.

In the light of the inherent instability of audiovisual data carriers any legal deposit legislation that demands the preservation of the very artifact should be reconsidered. It seems an undue financial - if not technically impossible - burden for future generations to preserve, for example, every single mass-produced cassette in the very form it has been manufactured.

(8) The rather exotic numerical magnitudes mentioned in this paper suggest a table of the prefixes standardized in the decadic numerical system:

1 k (kilo)	10^3	1 000	one thousand
1 M (Mega)	10^6	1 000 000	one million
1 G (Giga)	10^9	1 000 000 000	one billion
1 T (Tera)	10^{12}	1 000 000 000 000	one trillion
1 P (Peta)	10^{15}	1 000 000 000 000 000	one thousand Tera
1 E (Exa)	10^{18}	1 000 000 000 000 000 000	one thousand Peta

(9) Uncompromising digitization of 35 mm color film requires 40 MB (Megabyte) storage space per frame and 3.6 TB (Terabyte) per hour.

(10) The calculation of the required digital storage space is based on the full, unreduced (uncompressed) signals (cf. Schüller 1993), the following bit-rates and assumptions:

Audio: The bit rate of CD (44.1 kHz sampling frequency, 16 bit resolution) is 1.41 Mbit/s (Megabits per second), storage requirement for one hour is 635 MB (Megabytes). The respective figures for 48 kHz /16 bit formats like R-DAT are 1,536 Mbit/s or 691 MB/h. Development goes towards 20 bit resolutions and higher: 48 kHz/20 bit will require 1.92 Mbit/s and 864 MB/h. All these figures are calculated for (2-channel) stereo signals. Mono signals require half the rates. In the debate in the presentation of this paper George Brock-Nannestad suggested using, because of the uncertainty of the transfer, a 96 kHz/20bit format for historical recordings like cylinders and shellacs. This suggestion, however, would - in view of the comparatively small amount of historical records - not significantly alter the order of magnitude of worldwide required storage space.

For calculation the 48 kHz/20 bit format was used. It was assumed, that half of the material is mono, half of it is stereo.

Video: For the digital video signal (standard definition, i.e. 625 lines/50 Hz or 525 lines/60 Hz, not HDTV) the bit rates/storage space depends on the method of coding: composite coding, which has the luminance (Y) and colour difference signals (U/V) combined, requires a bit rate of 152 Mbit/s (for the 625 lines/50 Hz format) resulting in around 70 GB storage space for the hour. Component coding, which for better quality handles and stores the luminance and the colour difference signals separately, requires 270 Mbit/s or 122 GB/hour (CCIR 601).

Taking the component format CCIR 601 for calculation, 8.6 million hours represent 1050 PB. Assuming, that historical material could be coded - without loss of quality - in the composite format, and further assuming, that this would be applicable to 50% of the worldwide holdings, the sum of all video materials would still require an impressive 825 PB.

Literature:

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D Schüller, Towards the Automated "Eternal" Sound Archive. In: Boston, G. (Ed.), *Archiving the Audiovisual Heritage*. Proceedings of the Third Joint Technical Symposium, Ottawa 1990, 1992, 106-110

D Schüller; Introduction to Bit Rate Reduction and its Consequences for Sound Archiving. In: *IASA Journal* 2/1993, 32-35

Post script:

This paper represents the personal views of the author. These may not necessarily be shared by all members of the IASA Technical Committee. The official view of the IASA TC is expressed in the Canberra Resolution (cf note 5) and still suggests analogue tape as the preferred master storage medium.

This implies, however, that the original quality of digital recordings is not fully preserved, while most of newly recorded items are made in the digital domain. However, as shown in the paper, new ways of digital preservation are just about to be introduced.

In the light of this situation and of the recent debates at the IASA/FIAT conference in Bogense, the Technical Committee feels obliged to review the situation and to work out, during the current academic year, a Digital Archiving Policy Paper.

This article could be used as a starting point for discussion.

MASS STORAGE BASED SOLUTIONS FOR DIGITAL MEDIA ARCHIVES

Joachim Stark, IBM, Germany

Paper presented to the Technical session during the IASA/FIAT conference in Bogensee 1994

INTRODUCTION

I want to focus on an overall, end-to-end, solution view for Digital Media Archives. As illustrated during this technical session, there is a variety of scenarios for audio and video archives to go digital. Hence there is no unique solution, that can be applied to all of these scenarios, but still there are some generic components which can be found in all such solutions.

So let us look at the generic solution structure

- a functional view of the solution components
- a technical outlook with consideration of scalability and flexibility
- exemplary demo scenario

GENERIC SOLUTION STRUCTURE:

From a high level point of view, an end-to-end solution for a digital media archive is comprised of 4 major functional components, which build up the generic solution structure

These components are

- Archive Manager and Mass Storage
- Database Manager
- Network
- Clients

ARCHIVE MANAGER AND MASS STORAGE:

The Archive Manager component is the central element, the repository for all media content. It is responsible for the physical storage of any kind of media content, that is to be archived (be it audio, video, images, compound media in any formats). Typically the content will be imported from some client workstations via the network. For available content it needs to manage storage hierarchies efficiently according to environment specific requirements, ie. place specific content on computer disk or on mass storage devices like automated tape libraries. Automated data integrity checks

and automated backup/restore processing are another responsibility of the Archive Manager to avoid potential damage to the media content. For all users that want to access the content stored here, the Archive Manager must allow for checking the appropriate access authorization and registration on an individual basis. If the access is validated the Archive Manager is responsible to deliver the content to those clients via the network.

DATA BASE MANAGER

In this component all cataloguing and documentation information about media content will be found, with potential extensions to newly modelled relations between primary media content and other more abstract objects (eg. people, images, lyrics, biographies...). Granular access authorization for individual users is registered and managed here as well as other media related information like copyrights and royalties.

CLIENTS AND NETWORKS

The interfaces to the users of such a digital media archive via local area networks, private or public telecommunications networks can be used in various ways for different types of users, be it the archivist itself for media content capture and administration, a documentalist for cataloguing, editors for retrieval, playback, and broadcast usage for example, as well as (post)production people for content generation and manipulation. They all search for and access some media content or place more content in the archive via client workstations that are attached via the networks.

TECHNOLOGICAL OUTLOOK, SCALABILITY, FLEXIBILITY

Mass Storage Subsystems like automated tape libraries can be built in units up to some 30TB each (ie. an equivalent of 50,000 hours of CD-quality audio) on roughly 10sqm, thus providing huge storage capacities by attaching multiples of such subsystems to an appropriate server. Using proven information technology components like serpentine longitudinal recording eliminates the need for development, support and maintenance of media specific devices. Standard interfaces (SCSI-2 and ESCON) to servers provide system level data rates of up to 9MB/sec. Long distance mirroring of all data for disaster recovery (48km with ESCON attachment) provide enormous security capabilities. Based on the modular design of such subsystems, growth can be implemented in 2-4TB increments providing high flexibility.

The *Archive Manager* component can be implemented on various platforms (eg. Unix, MVS,...) supporting parallel processor architectures for scalable performance options. Installed data processing equipment may be used to exploit existing infrastructures and protect previous investments.

The *Data Base Manager* component can be implemented on any standard relational data base product, optionally exploiting existing data bases and data base applications. This component can reside on a separate physical system or on the same system as the Archive Manager.

EXEMPLARY DEMONSTRATION SCENARIO

In the IBM Development Laboratory in Boeblingen, Germany one potential incorporation of such an end-to-end solution has been set up and is being demonstrated to customers. In this local network setup several types of systems and operating systems are used to demonstrate the smooth interoperability. From a user's point of view, no command languages or operating systems need to be understood, nor are the different system architectures visible to the users, as all interaction within the archive solution is initiated by a highly user friendly application, with all system dependent aspects being covered by the customized application.

CONCLUSIONS

With the generic solution structure described, electronic media of various types can be integrated and managed in such a solution.

Using standard computer technology allows us to build efficient, economic and reliable end-to-end archive solutions.

Individual customer requirements can be reflected in the flexible, environment specific solution development.

The modular concept allows small-scale entry via pilot projects with granular growth options in data volume and system performance.

The basic technology components are already available or soon to be launched.

Prototypes and Demo Systems are up and running.

ON THE WAY TO A FULLY INTEGRATED MEDIA - ARCHIVE DIGITAL MASS STORAGE IN MEDIA ARCHIVES: A SOLUTION BASED ON THE SONY DIR-1000

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Paper presented at the Technical session during the IASA/FIAT conference in Bogensee 1994

It was in 1979, that is only 15 years ago, that the terms "PCM - Recording" and "Digital Audio Recording" became important to the community of audio engineers and producers. In the course of this very year several important audio recording formats were either introduced or announced which have, since then, caused a real revolution in the entire audio recording business.

In that period of time the expert's discussion was focussed on items such as Word Length, Sampling Frequency, Quantization Curves, Emphasis and the like, while the engineers were concerned about suitable A/D and D/A Converters, Filters, Channel Codes, Error Correction Schemes etc. but there were also hot debates about recording formats.

One camp was strictly in favour of Rotary Head technologies as it appeared quite easy to provide the necessary recording Bandwidth, although a distinct disadvantage seemed to be the fact that splicing the tape was impossible as a means of editing. A solution to this indispensable requirement was the development of an electronic editor. The other camp vigorously promoted the Stationary Head Technology as having better audio appeal and offering the possibility of splice editing. The optical recording technology was introduced in prototype form, but nobody could imagine at that time, that a recordable optical disc could become reality. All three recording technologies have matured since then and gained significant market share.

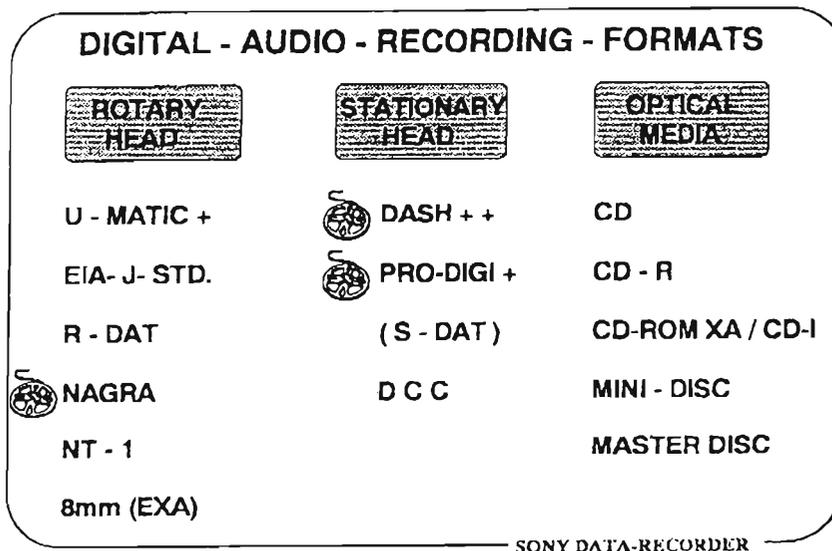


Fig. 1 Formats available based on the mentioned technologies.

All formats mentioned so far produce software bound to be stored in an archive of some kind, side by side and in addition to the analog tapes / discs and cassettes already stored; a familiar situation.

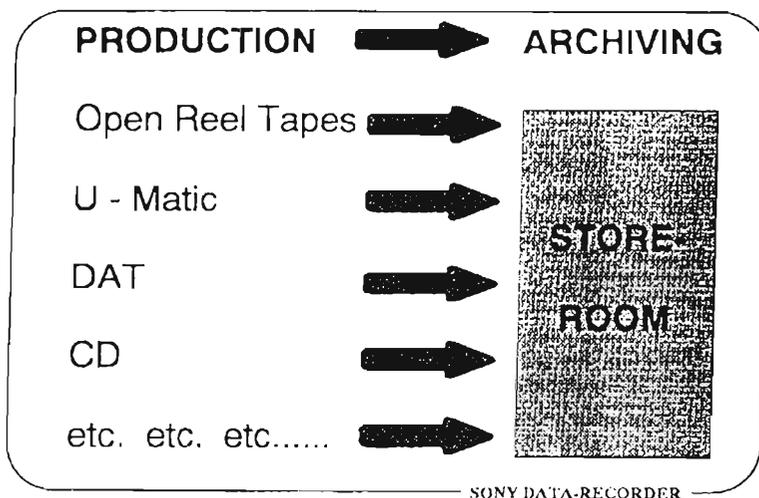


Figure 2

ARCHIVES TODAY

Storerooms with shelves for media
Manual Access only
Stock / Inventory / Availability / difficult to control
Integrity of Information difficult to control
Aging problems > (self -) destruction
Increasing number of media and Formats
Interdependence between media and hardware
Increasing acceptance problems for more / new media and formats

Search for the ultimate and ideal format

This scenario gives a rather pessimistic impression of the archive as it appears today and indeed, there seems to be little perspective to make the archivist enthusiastic about digitally recorded software.

There are nevertheless a number of basic advantages related to digital which are essential for archiving:

* during recording digital signals, additional information for error detection is also recorded, which allows error rates to be measured, so that the playback signals themselves carry an objective, absolute measure of their recording quality.

* since there is even more redundant information for error correction recorded, playback errors can be corrected, so that the original signals can be reproduced with objective perfection.

The practical advantage is, that the degree of reliability of both the data carrier and the reproduced data can be objectively assessed, a feature not available in analogue recording. Under normal conditions, the copy of a digital recording will be identifiable and reliable as an exact replica or "clone" of the data of the original recording.

This is the indispensable prerequisite to perpetuate and preserve the recorded information.

And there is yet another advantage which will soon become of interest for the archivist: by encrypting digital recordings we can ensure that only an authorized party can retrieve the original data, and that the data cannot be accessed without authorisation and remain will free from misuse and tampering.

In the long term there will only be digital. I believe this statement is undisputed! But there is a big question mark attached to the recording or storage media.

Is any one of the formats which were listed on the first chart a potential candidate for long term archiving or should we wait for other, new technologies?

Radical new media (holographic recording, recording crystals, bio memories etc.) have been under discussion for years. Effectively they have not left the imagination or the laboratory and it is fair to say, that they do not exist. From a practical point of view, two technologies are available now: the Optical and the Tape Technology. Both technologies are being continuously improved, but there are certain limitations, which cannot be improved significantly: for the tape this is access time and for the optical disc it is the data transfer rate. One cannot deny, that optical discs are very attractive but their only advantage over tape is access time. In all other parameters the tape outperforms optical discs.

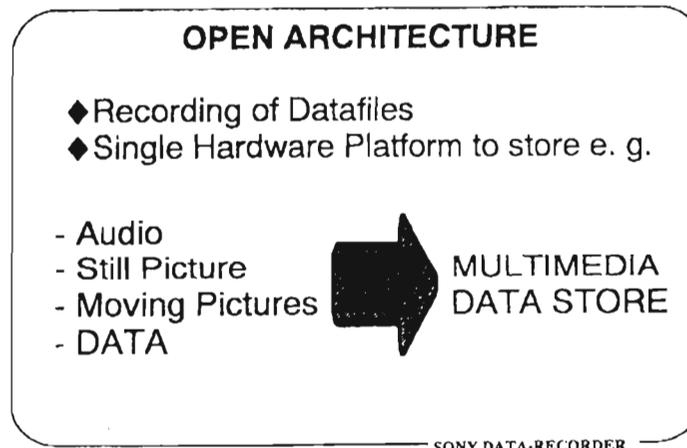
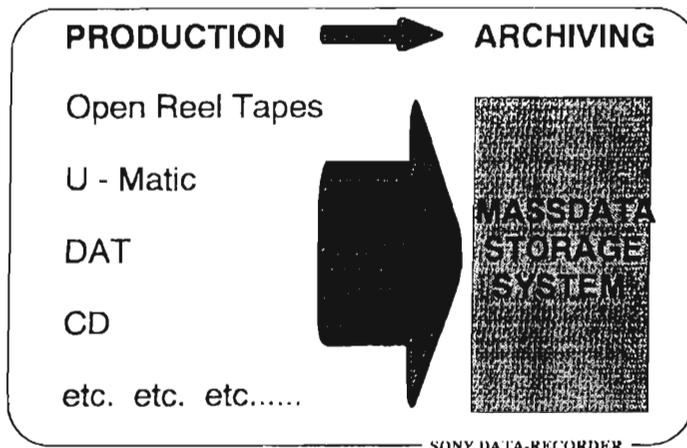
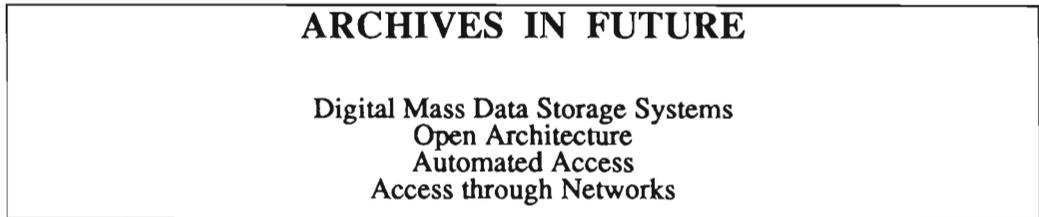
Is media life an essential parameter? yes and no! All other parameters being equal (although they are not) 100 years of media life is better than 30 years. In both 30 and 100 years though it is fairly certain that no existing recording format will still be supported by hardware.

In other words: System life is a natural limit to media life (other limits will be the economics in media cost, size, maintenance etc.) Long term archiving cannot be conceived without accepting the risk, and planning for the possibility of repeated transfer from one carrier to the next. This is, by the way, mother nature's concept as well. All life on earth is passed on by copying information onto the next generation.

What needs to be preserved in reproducible condition by an archive is the data or archived information rather than the data carriers. It is far more efficient, to invest money in an intelligent system preserving data, than in physically stable but unmonitored media.

An ideal archive should not be based on a theoretical data carrier so good as to avoid re-copying, but should rather address efficiently the necessity of re-copying. This can be achieved by occasionally monitoring the recorded data's error rate and recopy it if a certain threshold has been reached. It should also be able to perform automated format transfer of parts or of the totality of the archive. It should perform this faster than real-time without requiring many machines operating in parallel. Finally it should provide negligible error rates and full data security.

With that in mind, I would like to sketch the future integrated media archive



AUTOMATED ROBOT - CONTROLLED ARCHIVE SYSTEMS

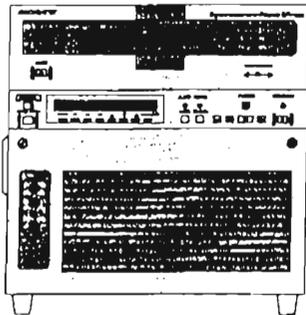
- ◆ Administration of huge Data Volumes
- ◆ Minor Floorspace Requirements
- ◆ Protected Environment
- ◆ Quick Access
- ◆ Carrierless Distribution of Information
- ◆ Stock / Inventory Protection
- ◆ Availability Assurance
- ◆ Data Integrity Control
- ◆ Automatic Migration possible

SONY DATA-RECORDER

The following is a candidate for a system capable of handling huge amounts of data in an open architecture. The basis is an ANSI Standard for Data Recording in the Instrumentation Field. The system features high capacity, high data rates at a very low media cost (approximately \$US2 per GByte).

DIR-1000

DIGITAL HIGH SPEED DATARECORDER



- ANSI X3B.6 ID-1 format
- cassette based operation
- High density recording up to 100 GByte per cassette
- High speed recording/playback up to 256 MBit/s (512 MBit/s optional)

SONY

INSTRUMENTATION & DATA RECORDER

Figure 3

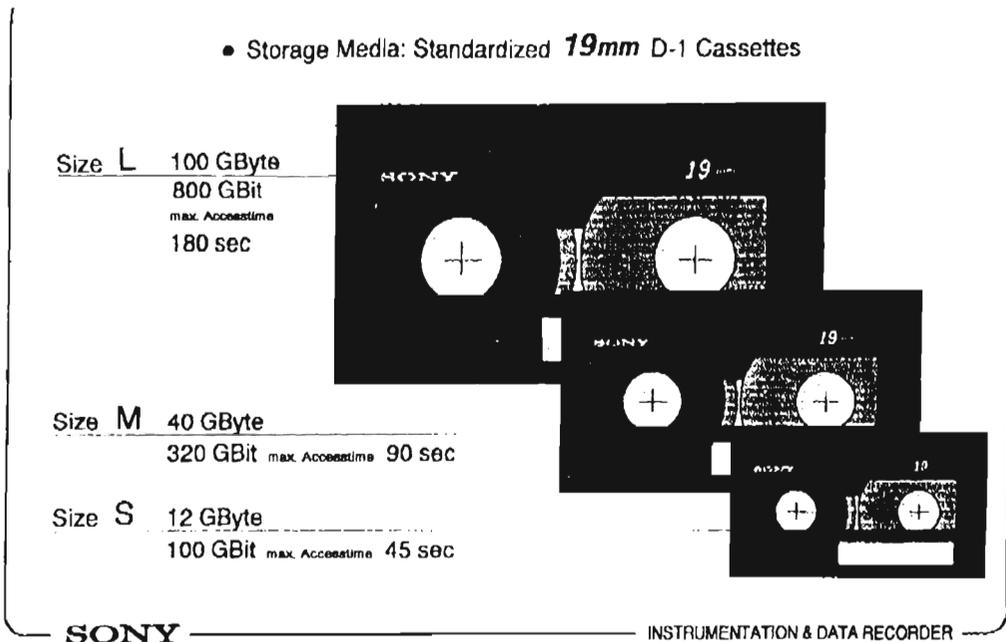


Figure 4

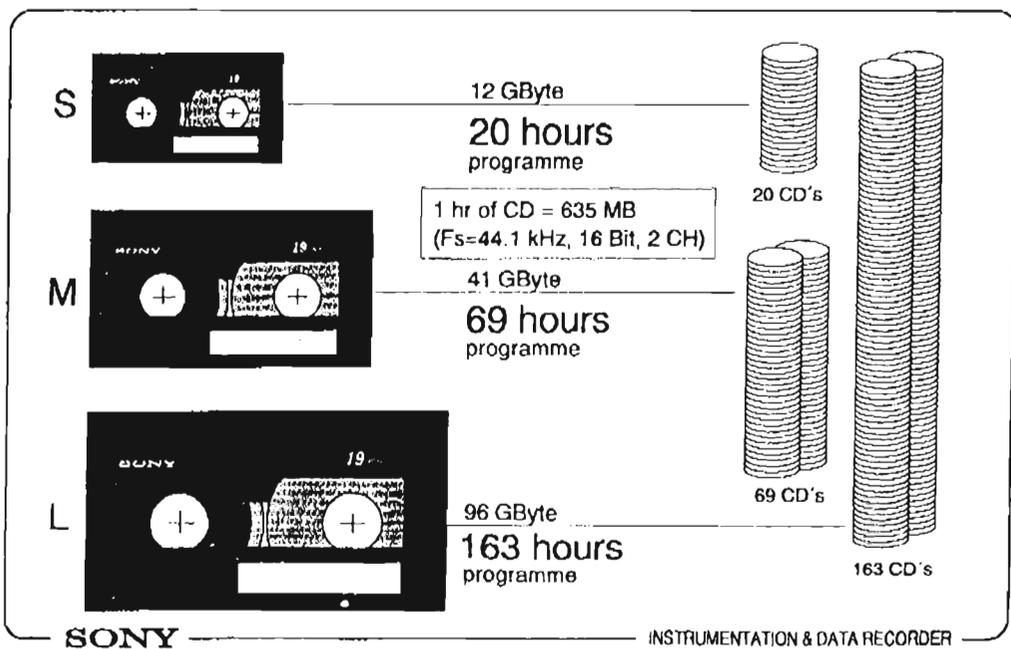
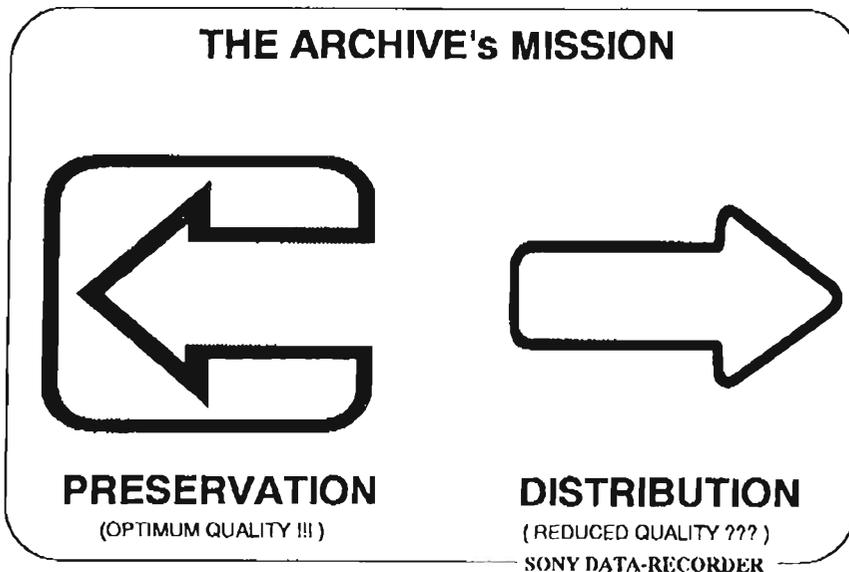
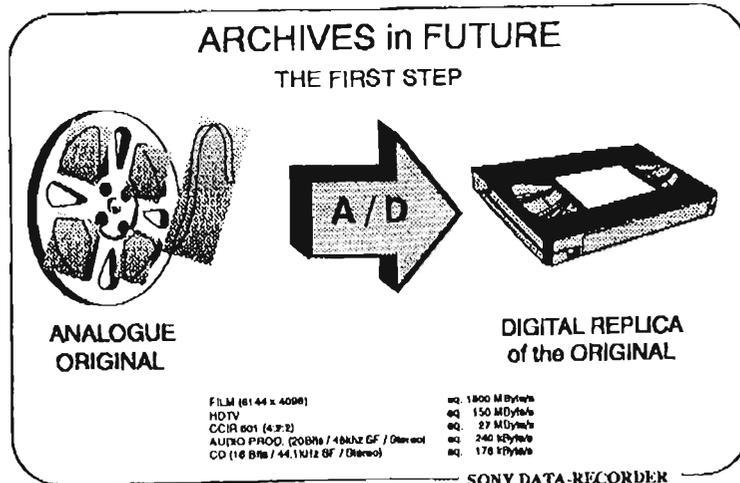


Figure 5



There is consensus, that information stored in an Archive should not be subject to data reduction, however future communication channels will only allow a fraction of the original data to be transmitted to the user. It is therefore of interest to discuss how the archive's mission can be best achieved, taking into account the implication of data reduction on the distribution side only.

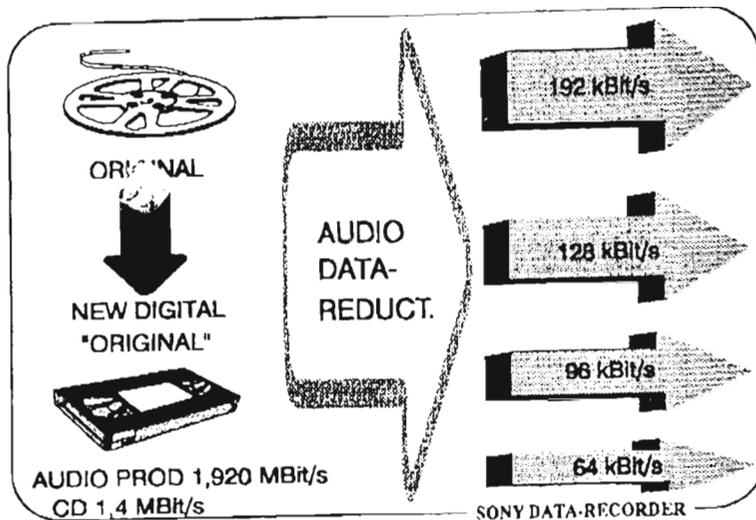


Figure 8

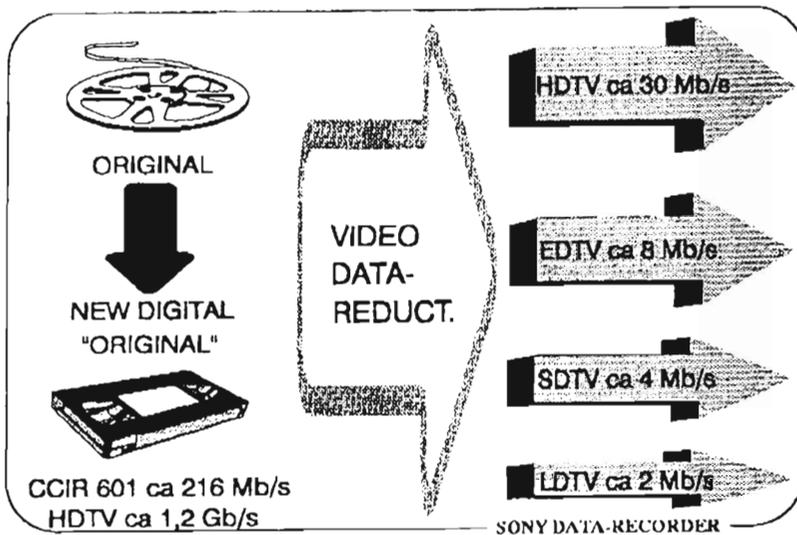
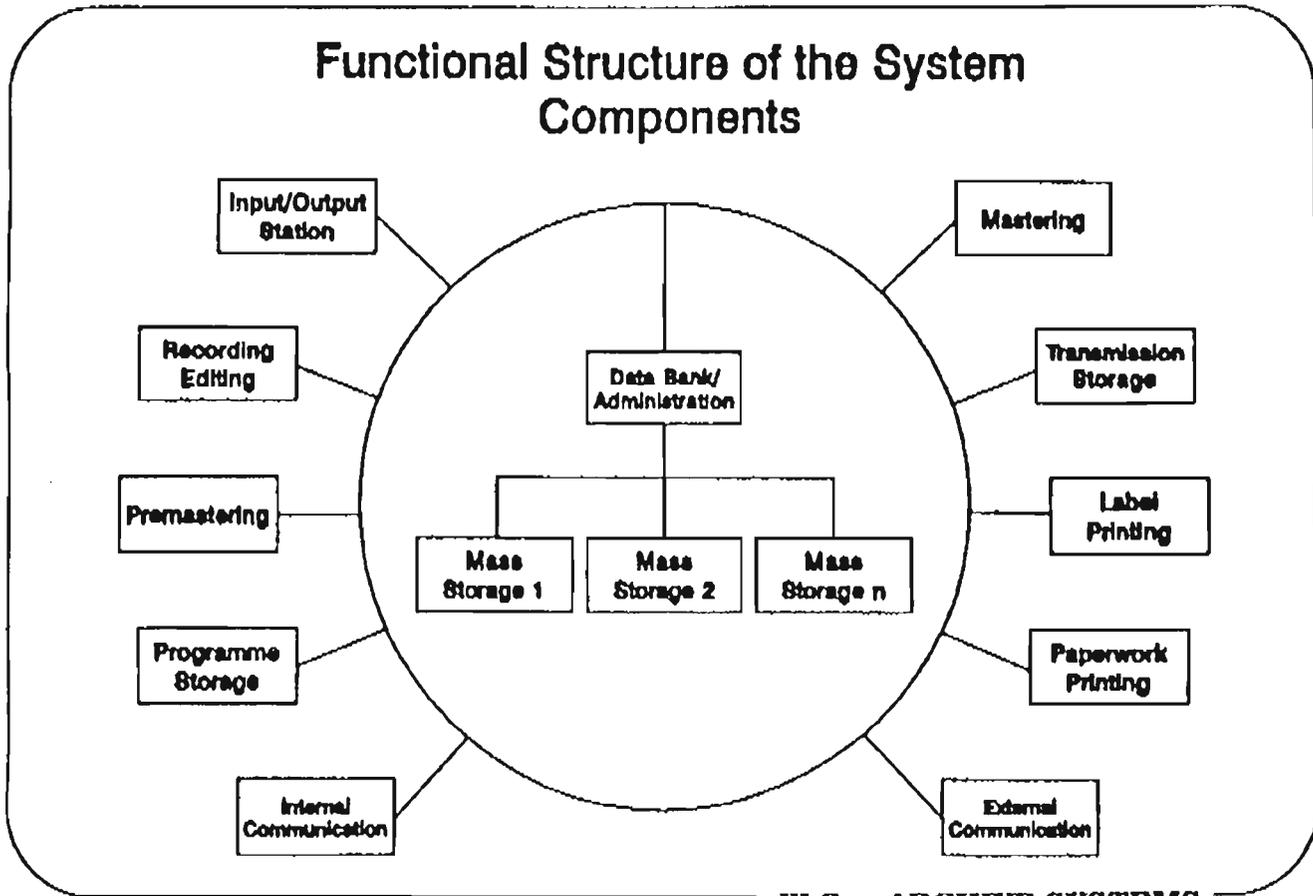


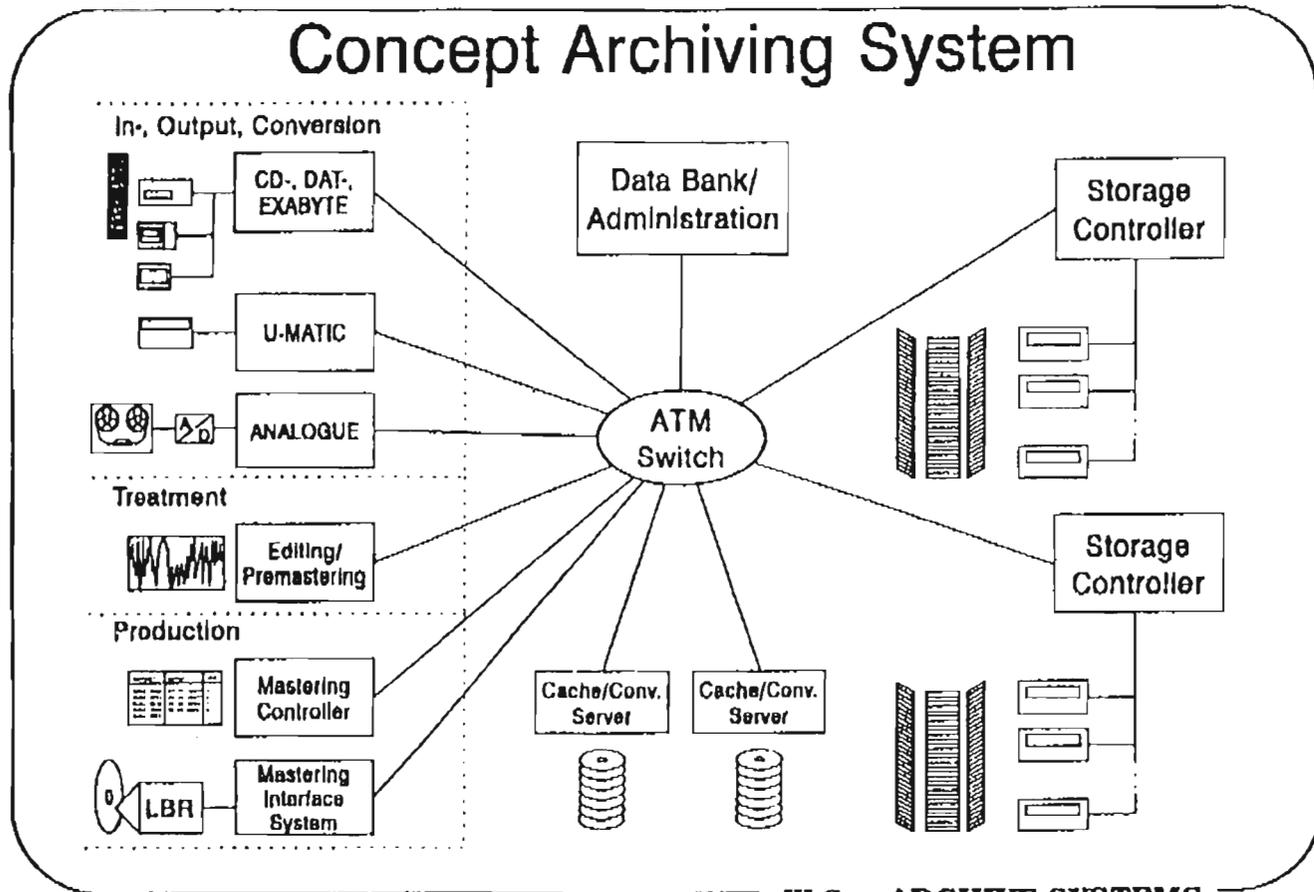
Figure 9

In order to target the problem of archiving properly, a Working Group Archive Systems was established under the umbrella of the Technical Committee of the Federal Association of the German Phonographic Industry in November 1993. The working group consists of members representing all major record labels, associate members representing the ARD, ie. the German public radio broadcasters and the Austrian Phonogram Archive and a number of industry representatives among them the author of this paper. The Group has met every month so far and has produced a set of specifications of an integrated Multimedia Archive System representing extends to a volume of some 120 pages.

These specifications define components and links of a very sophisticated and advanced System as outlined on the following two charts.



W.G. - ARCHIVE SYSTEMS



W.G. - ARCHIVE SYSTEMS

INTERNATIONAL AGREEMENTS

THE TOKYO RESOLUTION

ON

STRATEGIC ALLIANCE OF INTERNATIONAL INFORMATION ORGANIZATIONS TO SERVE BETTER THE WORLD COMMUNITY

We, the undersigned, international non-governmental organizations representing the information sector in the broadest sense of the word ie. production, acquisition, dissemination, management, preservation and use of information (hereinafter referred to as management and use of information), solemnly agree to create a Strategic Alliance based on the following rationale and objectives:

1. All countries - large and small, rich and poor share a deep anxiety about many global problems, ranging from the exhaustion of the planet's environmental capital to new global threats to health; the spread of poverty and famine; political and social tensions; demographic explosions; an unstable world economy and the deterioration of the quality of life. We believe that the proper use of information for decision-making at all levels of society will help solve humanity's problems as the world enters an age of greater awareness of the importance of information. To this end, it is critical to ensure continuity by documenting and preserving high quality records of the actions of society, through time.
2. All persons must have open and unrestricted access to information consistent with the protection of individual rights, appropriate economic incentives, and the concerns of nations and peoples as determined by their unique circumstances.
3. As stated in Article 19 of the Universal Declaration of Human Rights "Everyone has the right to freedom of expression and opinion; this right includes freedom to hold opinions without interference and to seek, receive and impart information and ideas through any media regardless of frontiers".
4. Societal improvements require a deeper and widespread understanding of how to find and use authentic information properly. Universal literacy, lifelong learning, education and training are essential to these improvements.
5. We, who are involved in the management and use of information face several forces of change. These forces are economic, political and cultural and include dramatic technological developments and vastly expanded user expectations for information services. The forces also present many challenges concerning the protection of intellectual property, the provision of access, protection of privacy, security, integrity and preservation of information, and the increased need for technical standards.

6. A particularly serious problem is the increasing information gap between various countries and societies within them, which is exacerbated by the increasing cost of information. Developing countries have an essential need both for information produced outside their frontiers and for information produced by themselves which must be properly managed, disseminated and used.

7. Each of our non-governmental organizations has its own distinct identity and objectives which should be preserved. Allied we represent a major force which can lead the way forward for the information professions. We realize that the societal problems are too great for any single organization to solve alone and that we should avoid any unnecessary overlap of effort. Intense collaboration, consultation and strategic planning are the answers.

We believe that a strategic alliance will contribute to advancing the goals of our organisations, contribute to the solution of the world's problems, better serve the world community and intensify our collaboration with Intergovernmental Organisations.

Our common goal is to serve society by:

- (a) Providing an international forum to address issues of common interest.
- (b) Identifying common issues in the management and use of information; clarifying diverging positions and agreeing on new cooperative solutions, especially concerning equitable access, balanced intellectual property protection, the protection of privacy, information systems security and common legal and technical standards.
- (c) Forecasting and assessing changes affecting the provision of information to meet expected challenges.
- (d) Ensuring that the information professions take a pro-active stance in studies aimed at elucidating future aspects of human endeavour.
- (e) Ensuring that the development and application of information technologies effectively meet the needs of users of information.
- (f) Encouraging the use of new teaching and learning technologies and other telematics techniques in education and lifelong learning starting at pre-school age.
- (g) Ensuring that the information professions, through education and training, maintain and further develop their knowledge and expertise in order to keep up with changes in the environment.
- (h) Encourage the development of communication training and education programmes that increase awareness of the importance of interactive communication between providers and users of information.
- (i) Advocating practices that guarantee the integrity and preservation of information irrespective of format and medium, and ensuring that the accuracy and quality of the information are maintained when it is passed along through its cycles of transformation and transfer.

(j) Ensuring that the cost and value of information are recognized in the development of information policies, programmes, systems, and services. However we need to try and influence policies to ensure that economic barriers do not prevent access to information.

(k) Encouraging the discussion of ethical issues for the information society and the development of principles (eg. codes of conduct for appropriate sectors) related to the responsibilities of the information professions.

(l) Encouraging the need for the development of strong policies on information by suggesting directions for future policy and strategic planning.

(m) Intensifying the collaboration between public and private sectors, in particular by infusing the values of each into the other.

(n) Influencing the creation of new viable product and service clusters both within the information sectors and with external partners.

(o) Encouraging the worldwide identification of information capabilities and the mobilisation of these for the solution of major global problems.

(p) Devising international programmes to strengthen the awareness of the value of information in all areas of human endeavour such as education, science, industry, culture and recreation.

(q) Creating awareness and promoting the role of international non-governmental organisations in information.

(r) Developing a coordinated, international approach to the research needs of the information field.

Signed by 31 NGOs on the occasion of the Centennial of the International Federation for Information and Documentation:

Editor's Note

The *Information Bulletin* No. 10 July 1994 reported that FID, (the International Federation of Information and Documentation, an UNESCO NGO had recently invited IASA to participate in the drafting of this Resolution on the international management and use of information. A meeting was convened on April 11 1994 to draft this Resolution and it was signed and published during the 47th Conference and Congress of FID in Tokyo in October. The IASA Executive Board agreed to sign this accord. The full Resolution is printed here. It is careful throughout to talk of Information in whatever medium this is transmitted and not to specify any one material. This allows all NGOs dealing with the transmission of information to participate, and prevents awkward questions of definition. It also allows for future methods of information transmission to be included as they arise.

REVIEWS

Guy A. Marco (ed.), Frank Andrews (contributing ed.): *Encyclopedia of recorded sound in the United States*. New York and London: Garland Publishing, 1993. 910 pages, 26 x 18 cm.

Guy Marco's encyclopedia of recorded sound is a monumental work. It is essential reading for anybody interested in recorded sound and the archiving of sound.

Having said this, I might as well start with the book's weaknesses. As the editor confesses in his preface, he originally set out to write a world encyclopedia of recorded sound, but soon found out that the task was impossible. The next version was to be a work covering the first hundred years of recorded sound in the United States and Europe only. Even this proved too much, and the published version focuses on developments in the United States up to 1970.

It soon becomes obvious to the reader that the book contains material from all three stages. Starting at random on page 44, for instance, we have entries for pianist Daniel Barenboim, bandleader Charlie Barnet, British record company executive William Barraud, composer Bela Bartok (pioneer of ethnomusicological field recording), base (the backing of magnetic tape), baseball records, and the German company BASF AG. There is a lot of material on European developments which do not have any direct connection with the United States, and particularly detailed information on British record companies of the 78 rpm era, thanks to the work of contributing editor Frank Andrews. There is also a great deal of material on developments after 1970 to bring the book up to date on such developments as the compact disc and DAT (but no entries on DCC or MD).

But who am I to complain? A volume that would have been true to the title would have been slimmer, but hardly better. As it is now, I will gladly accept the occasional imbalance in the choice of entries in exchange for the additional information included. For instance, I am glad to have the long article on IASA included, although one could argue that an entry on ARSC would have been enough.

As one can see from the brief sample of entries above, the encyclopedia covers persons, companies and topics connected with sound recording. In addition to the recording industry, there are entries on other areas of sound recording and reproduction: acoustics, amplifiers, studios, measuring instruments, you name it. I was at first surprised to see an entry on "hearing", but after reading it I have no complaints.

Several entries are actually small essays. There are extended articles on blues recordings, Canada, collectors, country and western recordings, cylinders, discs, discography, Edison, folk music recordings, jazz, literary recordings, loudspeakers, microphones, opera recordings, orchestral recordings, piano recordings, preservation, restoration, rock records, and sound recording periodicals, and on major record companies. The level of these contributions is uneven. Some of the entries on musical genres were rather disappointing, but at least there are references to guide to novice further. Some are excellent. For instance, I found much new information in the article on "orchestral recordings", and the article on "sonic restoration" (contributed by Michael Lane) is the best single introduction to this complicated topic I have read so far.

Of course every reader will also find reason for criticism. I found myself frequently wondering why a particular entry was included but another, in my opinion equally important, topic was excluded. The book does suffer from a balance problem. No doubt minute search will also uncover errors. But there is no doubt that every reader will learn something new, and many of us will be using the book regularly as a reference work.

Pekka Gronow

BRIEF REVIEWS

Norsk musikkfortegnelse. Lydfestinger. The Norwegian national discography 1990-1991. Oslo: Universitetsbiblioteket, 1993. 97 pages, 25 x 17 cm.

During the past few years, sound archiving in Norway has progressed rapidly. The legal deposit of sound recordings was introduced on July 1st, 1990, and the Oslo university library has now published the first volume of the national discography.

The discography follows the MARC format also used by the other Scandinavian national discographies. The listings are alphabetical by the main entry, and there are indexes for persons and titles. The first volume covers two years, but in the future annual publication is expected. The information is accessible on-line at the university library, and it is also available on CD-ROM as part of the national bibliography.

The discography is professionally compiled, and the layout is clear. My only question marks concern the extent of coverage. According to the preface, the listings cover recordings deposited in the library in 1990 and 1991 (presumably during a period of one and a half year), and additional productions of Norwegian music produced abroad purchased by the library during the same period. The total number of listings is only 532, and many of the recordings listed have been published already in 1988 or 1989, suggesting an annual production of about 350 titles.

Finland has approximately the same population as Norway, but annual record production is about 1500 titles. It could be that I am wrong, but I have the suspicion that legal deposit in Norway is not yet functioning one hundred per cent complete. However, the new national discography is to be heartily welcomed, and if there are omissions, I am sure they will be corrected in future volumes.

Per Dahl: *Jeg elsker dig på 252 måter! Et sangerleksikon og en diskografi over grammofoninnspillinger av Edvard Griegs romanse opus 5 nr. 3*. Oslo: Solum, 1993. 255 pages, discography, musical examples, 21 x 14 pages. NOK 230.

This little book would appear to have a very limited subject, but it opens visions to larger fields. "Jeg elsker dig" (I love you), written by Edvard Grieg in 1865, has become one of the most widely performed and recorded solo songs, and certainly one of the internationally best known Norwegian songs. There are thus good reasons for a study of the 252 recorded versions of this song.

The song had become well established already before the invention of the sound recording, and the first recording dates from 1899. There were more than fifty recordings before 1920, and it continues to be recorded regularly. Recent interpreters include Jose Carreras, Elisabeth Söderström and Matti Salminen. It has been recorded in translations to more than ten languages; the more unusual versions include a 1947 recording by Frank Sinatra.

Included are also facsimile reprints of H C Andersen's original poem, Grieg's manuscript and four different published editions. Even if you do not speak Norwegian, this book is well worth having, if you are at all interested in recordings of solo songs.

Michael Webb: *Lokal musik. Lingua franca, song and identity in Papua New Guinea*. Apwithire: Studies in Papua New Guinea Musics. Boroko: National research Institute, 1993. 272 pages, 21 x 14 pages, illustrations, musical examples. (Available from the National Research Institute, P.O.Box 5854, Boroko, Papua New Guinea, for 7.50 Kina plus postage).

Thanks to the pioneering work of Don Niles at the National Research Institute of Papua New Guinea ("Commercial recordings of Papua New Guinea Music, 1949-1983", etc) we have an excellent coverage of the surprisingly rich production of recorded music in this country. In this study, Michael Webb takes the work a bit further. The main purpose of the volume is to study song texts in the Tok Pisin (Pidgin English) language and their content, but it opens a rich view of Papua New Guinea society, the development of modern PNG music and the growth of the local recording industry. This is a major contribution to the study of the music industry in Third World countries.

2nd Radio Montreux 9-11 June 1994. International radio symposium and technical exhibition. Engineering symposium record. Geneva: European Broadcasting Union. 306 pages, illustrations, tables.

This is the latest instalment in the continuing story of digital radio. DAB or digital audio broadcasting was the central topic of the international conference organized by the European Broadcasting Union in Montreux last June. This publication summarizes the results of the technical symposium. The contributions from over thirty speakers range from detailed engineering studies to brief commentaries. Topics range from studies on the propagation of radio waves to audio compression.

Several contributions are of considerable interest to sound archivists. Especially important is the article by Michael Thomas of the Institut für Rundfunktechnik in Germany on computer based digital technology in studios and broadcasting. Thomas discusses the current status of integrated digital systems where the entire operations of radio stations, from transmission to archiving, would be handled by computers. In practice this would mean using digital mass storage systems for archiving. Thomas concludes that an ideal system for this does not exist yet, but changes will come faster than expected.

Pekka Gronow

Rainer Strömmer & Urpo Haapanen. *Suomalaisten äänilvejjen luettelo 1946-1961, 78 kierroksen levyt.* (Catalogue of Finnish records 1946-1961. 78 rpm records). Suomen Äänitearkisto RY & OY Yleisradio AB. Äänilevystö. Helsinki (printed in Jyväskylä) 1992. iv, 435, (1) s. ISBN 951-9222-22-7. (Suomen äänitearkiston julkaisu, n:o 24.) 21 x 15cm. Price 200 Finnish marks. Available from Suomen äänitearkisti, Luminikintie 38 D 137, SF-03800, Helsinki, Finland.

Finland seems to be the only country (except tiny Iceland) that has published a full account of all its 78rpm issues. This is the second and much revised version of a volume that first appeared in 1967 and was reprinted in 1983 (that volume, however covered the years 1946-1966 and included microgroove issues as well).

Unlike the earlier version, which was compiled by the Finnish Sound Archive alone, this one is a co-production with the Gramophone Library of the Finnish radio and one assumes that they were the ones to insist that the playing time of every available title to be included (roughly 80% of the titles have this information).

There are 22 major and 25 minor labels included. Full discographic details are given, ie. artists, titles, composers, lyricists, catalogue numbers, matrix numbers (including takes), recording dates, (here the compilers were helped by the diary of an engineer in the case of some labels for which no recording ledgers exist), but not recording locations (which in most cases is Helsinki, of course, but in several cases Stockholm, Copenhagen, Berlin or London). Original titles of non-Finnish titles seem to be included only when they are given on the label, which creates a problem for someone not familiar with the Finnish language (especially as you must quite a bit of this language just to be able to use a Finnish-English dictionary, for example). The listing is numerically by label, which means the unissued titles are not included. Thus we get no details of the first 30 HMV recordings from 1951 which were rejected by the matrix department in Hayes on November 22 for reasons unknown.

Incidentally, this is not a complete account of Finnish issues of the period as catalogue series containing only non-Finnish recordings are not included (they are promised for a later volume).

Generally, the information given seems to be reliable. There are some minor error (Oscar Strauss for Straus on page 20 and 156, the omission of Irving Berlin's name for *Hand me down my walking cane* on page 22, Mack David as Mac David on page 67, Heino Gaze as Heizo Gaze on page 82 and Jay Gorney as Jay Corner on the same page, 10.9.55 for 1954 on page 135, 1956 for 1957 on page 137). In the case of 40 Triola titles the orchestral backing to the singers was actually taken from Swedish Triola and Roulette recordings of the period!

There are artist and title indices, unfortunately the former includes only the featured artists, ie. singers, but not the leaders of the accompanying groups. The title index gives only the titles in Finnish even when the original titles of foreign titles are given in the main listing. These are the only things that one can criticise in this excellently produced book.

Bjorn Englund, ALB, Stockholm.

RECENT PUBLICATIONS

Junge, Ewald: *Anthony Bernard, a life in music*. Including including 144pp book with 6 tape cassettes and recording notes in a presentation box. London, Ewald Junge, 1991.

This boxed set recently came my way as Editor and a full review could not be commissioned in time. This cannot claim to be a review, but it is drawn to the readers' attention as an interesting piece of the history of British music and music-making.

Anthony Bernard, born in 1891, has a principal claim in music to be remembered as a conductor, but he was also a teacher and professor of conducting and composition in the Royal College of Music during the 1920s. His conducting career was notable for his association with the London Chamber Orchestra with whom he worked for over 40 years, but his life is interwoven with so many other developments in music in England at a time when innovation was necessary. His work with the LCO, the BBC - especially background music for the drama department, Glyndebourne opera and Stratford theatre. His tastes and interests ranged from medieval to contemporary. reflected in this work.

The set consists of an informative and well illustrated book about Bernard, his life, career and contributions to music plus six audiocassettes of materials - carefully restored and ranging from 1929 to 1960, including music from Mozart to Berkeley and one of Bernard's own compositions. Notes on the recordings are also included and in their detail provide information which is so often missing from an audiocassette - back to the traditional sleeve notes of disc recordings. The set is issued in a limited edition and the cost is £30.00 or \$50.00 US. All orders and enquiries should go to Ewald Junge, Suite 454, The White House, London, NW1 3UP, England. Please make any money orders or drafts payable to Mary Bernard.

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

The date for copy of the next issue, Number 5 to be published in May 1995 is

31 March 1995

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