iasa

International Association of Sound Archives
Association Internationale d'Archives Sonores
Internationale Vereinigung der Schallarchive

phonographic bulletin

no.27/July 1980

PHONOGRAPHIC BULLETIN

Journal of the International Association of Sound Archives IASA

Organe de l'Association Internationale d'Archives Sonores IASA

Zeitschrift der Internationalen Vereinigung der Schallarchive IASA

Associate Editors: Ann Briegleb, Ethnomusiocology Archives, UCLA, Los Angeles;
Frank J. Gillis, Archives of Traditional Music, Indiana University, Bloomington.

Technical Editor: Dr. Dietrich Schüller, Phonogrammarchiv der Oesterreichischen Akademie der Wissenschaften, Wien.

The PHONOGRAPHIC BULLETIN is published three times a year and is sent to all members of IASA. Applications for membership in IASA should be sent to the Secretary (see list of officers below). The annual dues are at the moment 25.-Deutsche Mark for individual members and 60.-Deutsche Mark for institutional members. Back copies of the PHONOGRAPHIC BULLETIN from 1971 are available at 15.-Deutsche Mark for each year's issue, including postage. Subscriptions to the current year's issues of the PHONOGRAPHIC BULLETIN are also available to non-members at a cost of 25.-Deutsche Mark.

Le journal de l'Association internationale d'archives sonores, le PHONOGRAPHIC BULLETIN, est publié trois fois l'an et distribué à tous les membres. Veuillez envoyer vos demandes d'adhésion au secrétaire dont vous trouverez l'adresse ci-dessous. Les cotisations annuelles sont en ce moment de 25.-Deutsche Mark pour les membres individuels et 60.-Deutsche Mark pour les membres institutionnels. Les numéros précédents (à partir de 1971) du PHONOGRAPHIC BULLETIN sont disponibles au coût de 15.-Deutsche Mark par année (frais de port inclus). Ceux qui ne sont pas membres de l'Association peuvent obtenir un abonnement au PHONOGRAPHIC BULLETIN pour l'année courante au coût de 25.-Deutsche Mark.

Das PHONOGRAPHIC BULLETIN erscheint dreimal jährlich und geht allen Mitgliedern der IASA zu. Aufnahmeanträge für die Mitgliedschaft bei der IASA sind an den Sekretär (Anschrift siehe unten) zu richten. Die Mitgliedsbeiträge betragen derzeit DM 25.-für individuelle Mitglieder, DM 60.-für Institutionen. Frühere Jahrgänge des Bulletins (als 1971) können zum Preis von DM 15.-(einschließlich Porto) bestellt werden. Nicht-Mitglieder können das PHONOGRAPHIC BULLETIN zum Preis von DM 25.-jährlich abonnieren.

Printed in Vienna, Austria.

EDITORIAL

This issue of the BULLETIN includes the latest revision of the program for the annual congress in Cambridge, England, August 3 - 9. The IASA Board looks forward to greeting each of you in Cambridge.

Several papers which were read at the Salzburg meeting are included here: two papers from the Technical Committee session, plus the archival tape test results originating from a report presented at the Lisbon conference; the Copyright Committee presentation of Norbert Flechsig; and the presentation of Helmuth Mühle for the joint IAML/IASA Committee on music and sound archives. It is with great sadness that I include the obituary for Ivan Pethes whose sudden death earlier this year was a shock to those of us who enjoyed and benefited from his presence at our annual meetings.

Last, but not least, I would like to mention that negotiations are now underway to have the BULLETIN abstracted and indexed in RILM Abstracts. In addition to having the articles represented in the printed version of RILM, the information would be included in the Lockheed Dialog data base. Investigation is currently under way to find appropriate data bases in other countries in which the BULLETIN would be indexed.

Ann Briegleb

IASA PROGRAM FOR CAMBRIDGE MEETING

Cambridge, England
3-9 August 1980
(includes combined IAML/IASA sessions)

MONDAY 4 AUGUST

9.15 - 10.45 Sound Archives in the United Kingdom: Field Recording Programs and Practices (part I)

Chairman: Anthony King, British Institute of Recorded Sound

Papers and Speakers:

Oral History; Eric Cregeen, School of Scottish Studies, University of Edinburgh
Traditional music and song; Roy Saer, Welsh Folk Museum, Cardiff.

11.15 - 12.45 Sound Archives in the United Kingdom: Field Recording Programs and Practices (part II)

Chairman: Derek Lewis, BBC, London

Papers and Speakers:

Folklife; Stewart Sanderson, Institute of Dialect and Folk Life Studies, University of Leeds.
Dialect; Brendan Adams, Ulster Folk Museum, Holywood.

14.15 - 15.45 IASA Cataloguing Committee)
IASA Copyright Committee) members only
IASA Technical Committee)

16.15 - 17.45 IASA Cataloguing Committee
Towards Standard Catalogue Descriptions: Three case studies

Chairwoman: Anne Eugène, Phonothèque Nationale, Paris.

Ethnomusicology; Alice Moyle and Grace Koch, Australian Institute for Aboriginal Studies, Canberra
Oral History; Roger Smither, Imperial War Museum, London
Linguistics; Anne Eugène, Phonothèque Nationale, Paris

TUESDAY 5 AUGUST

9.15 - 10.45 IASA National Branches Working Group (members only)

14.15 - 15.45 IASA Technical Committee

Chairman: Dietrich Schüller, Phonogrammarchiv der Österreichischen Akademie der Wissenschaften, Vienna

Papers:

Digital Recording; speaker to be announced
Standardization of Fire Regulations for Sound Archives; speaker to be announced

WEDNESDAY 6 AUGUST

9.15 - 10.45 IASA Executive Board Meeting (members only)

11.15 - 12.45 IASA General Assembly

14.15 - 15.45 IAML-IASA Committee on Music and Sound Archives/IAML Commission on Education and Training: The Training of Sound Archivists

Chairman: Derek Lewis, BBC, London

Speakers:

Hansjörg Xylander, Bayerischer Rundfunk, Munich
Prue Neidort, National Library of Australia, Canberra
Huib Deetman, Openbare Musiekbibliotheek, Amsterdam

16.15 - 17.45 IAML-IASA Committee on Music and Sound Archives/IAML Commission on Education and Training: The Training of Sound Archivists (continued)

THURSDAY 7 AUGUST

9.15 - 10.45 Oral History Interviewing

Chairman: Ernest Dick, Public Archives of Canada, Ottawa

Papers and Speakers:

Objectives and Approaches; Phillipe Joutard, University of Provence
Practice and Problems; Margaret Brooks, Imperial War Museum, London

11.15 - 12.45 IAML-IASA Committee on Music and Sound Archives. Radio Sound Archives: The needs and problems of commercial record radio archives -- exchange of experiences and ideas (Open to all radio sound archivists).

Chairman: Dietrich Lotichius, Norddeutscher Rundfunk, Hamburg

14.15 - 15.45 Copyright Committee
Model Contracts for Sound Recordings: UNESCO Proposals and Practice Among Selected IASA Member Archives

Chairman: Robert Ternisien, Canadian Broadcasting Corporation, Montreal

Speakers: To be announced

FRIDAY 8 AUGUST

9.15 - 10.45 IAML-IASA Committee on Music and Sound Archives: Access to Radio and Record Industry Archives

Chairman: Claes Cnattingius, Sveriges Radio, Stockholm

Speakers:

Joachim von Hecker, Bayerischer Rundfunk, Munich
Pierre Chenais, Syndicat National de l'Édition Phonographique et Audio-visuelle, Paris
Charles Delauney, Paris
Trevor Pearcy, IFPI, London.

14.15 - 15.45 Research Use of Radio Sound Archives: Implications for the Documentation of Spoken Word Recordings

Chairman: Ulf Scharlau, Süddeutscher Rundfunk, Stuttgart

Speakers:

Hansjörg Xylander, Bayerischer Rundfunk, Munich
Georges Manal, Radio France, Paris.

TECHNICAL COMMITTEE

STORM, WILLIAM
Assistant Director, Thomas A. Edison Re-Recording Laboratory
Syracuse University Libraries

THE ESTABLISHMENT OF INTERNATIONAL RE-RECORDING STANDARDS

This paper was presented by Mr. Storm at the IASA Technical Committee open session, Salzburg. It does not reflect the official opinion of the Technical Committee, but was put forward as the basis for future discussions within the Committee.

For many of us in the International Association of Sound Archives (IASA), preserving sound for posterity is both occupation and goal; and neither is easy. But what adds to the difficulty is that audio archivists have not yet agreed on or developed, universal re-recording standards.

Re-recording is indispensable to the preservation of sound. Yet, with no standards, what assurances have we that a re-recording represents a faithful reproduction of the original sound? Without such an assurance, re-recording sound for posterity becomes an exercise in personal preferences. Therefore, the purposes of this paper are (1) to recommend the establishment of international re-recording standards, and (2) to suggest the conditions necessary to facilitate the formulation of such standards.

CONDITIONS

There are three conditions that should precede consideration of re-recording standards. The first condition is that we agree that the inherent sound quality of the records is their primary value. Most people are visually oriented and readily treasure that which they can see -- books, paintings, antiques, etc. Sound, on the other hand, is usually taken for granted and rarely receives the emphasis it deserves. We can even find record collectors who value the recordings more as art objects to be looked at, rather than listened to.

It is true that the variety of colors, sizes and shapes of recordings are visually intriguing. However, as sound archivists we must be careful not to become pre-occupied with the visual to the detriment of the aural characteristics. Our purpose is to preserve sound, and it is to that purpose we should be devoting our time, attention, and skills.

The second condition is that since re-recording is essential to our purpose, we must encourage communication regarding re-recording techniques. It is most surprising that since its inception

in 1971, IASA's Journal, PHONOGRAPHIC BULLETIN, has rarely published articles exploring the topic of re-recording techniques, let alone the standardizing of them. Many articles did contain lists of equipment in certain institutions, but only alluded to methodology. Furthermore, when the topic of standards did appear it was generally confined to the selection, format, and preservation of tape. But we must recognize that tape is only a storage medium; it has little value if the method for transferring the original sound to the tape is not accurate and verifiable.

One journal article that did concentrate on the re-recording process was written by Wilfried Zahn, of the Deutsches Rundfunk Archive, Frankfurt.[1] Mr. Zahn described various analytical techniques his laboratory has been using to gain a better knowledge of Edison's recording and reproducing technology. Cylinders were optically analyzed both in the reflected mode and by taking groove impressions. This was followed by spectral analysis of pink noise recorded onto, and reproduced from, previously blank cylinders. Finally, a re-recording process was illustrated that used an electronic pick-up and a phasing circuit as a means to reduce noise from cylinders.

While the validity of this or any other re-recording technique may be debated, at least in this instance archivists have the opportunity to evaluate the merits of the process. Communication of this sort can help to determine the re-recording elements that require standardization, and once established, assure conformation with these standards.

The technical procedures described by Mr. Zahn point to the third condition we must consider: the implementation of re-recording standards and the investigation of re-recording techniques requires expertise in audio engineering. Re-recording is not a simple dubbing process that is easily performed because you have a turntable, amplifier, speakers, a tape deck, and the recommended type of tape. False impressions can be created as to what many early recordings really sounded like unless procedures and terms are properly defined and understood.

For example, "straight" dubbing and "flat" dubbing are often understood as meaning the same thing. They are not. If the purpose of "straight" dubbing is to faithfully reproduce the originally intended sound of a record, then "straight" dubbing should not be understood as synonymous with "flat" response phono pre-amplification. Re-recording all records with a "flat" response phono curve would be an error, since many manufacturers required different playback curves to compensate for intentional equalization pre-emphasis used in the original recording process. Older Columbia records had a different playback curve than do newer ones. The same was true for RCA, Decca, and others. This is only one of many technical variables that must be taken into account in the development and verification of re-recording processes. Re-recordings should be produced by qualified engineers who can appreciate these problems and are able to see that prescribed standards are followed.

The conditions necessary to promote the establishment of international re-recording standards are in short: 1) to first recognize that the sound within a record is the most important thing

[1]Zahn, Wilfried, "About the Reproduction Problems of Edison Cylinders", PHONOGRAPHIC BULLETIN, No. 21, (July '78), pp. 28-29.

to save; 2) that saving the sound requires common knowledge of the re-recording techniques; and 3) that re-recording should be performed by qualified personnel.

TYPE I AND TYPE II RE-RECORDINGS

At this point, it is important to recognize that sound preservation can take two legitimate directions: (1) the sound preservation of audio history, and (2) the sound preservation of an artist. In this context, audio history sound preservation is defined as the perpetuation of the sound of an original recording as it was initially reproduced and heard by the people of the era. Sound preservation of an artis, on the other hand, is defined as the perpetuation of the true sound of a performer. In its purest form this means the faithful re-creation of the live sound of an artist. The preservation of an artist's sound is not the same as ausio history preservation, but, rather, a dependent function of it. In other words, the preserved live sound can only be as good as the audio recording equipment and engineers of the time. The Edison tone-test concert series was a serious effort to make the live versus recorded sound comparison but, generally, experimentation and battles to gain control over the market by manufacturers did little to guarantee sonic authenticity. So it may be argued that many early recordings were not faithful to the artists and that this justifies manipulation of the normal playback criteria for the recordings.

As audio archivists, to whom do we owe our allegiance -- to audio history or to the recording artists? The answer had to be both since the qualities of one cannot be understood without knowing the qualities of the other. Consequently, not one but two types of re-recordings are possible from each original record.

Type I preserves audio history, and Type II attempts to re-create the live sound of an artist. If guided by standards, Type I re-recordings of identical records should, theoretically, sound the same regardless of where the re-recordings were made. On the other hand, Type II re-recordings can be experimental and may initially sound quite different. But these, too, if guided by standards, should eventually culminate in similar reproductions of the performer's live sound.

The following guidelines are based on this concept of two re-recording types. They are by no means complete, but the hope is they will stimulate constructive criticism and further discussion.

STANDARDS FOR AUDIO HISTORY PRESERVATION

The first set of standards is primarily directed at Type I re-recordings, or audio history sound preservation. You will recall the premise that audio history sound preservation is based upon, the replication of the recordings as they were originally played and perceived by the people of the era.

The first standard is to index all identifying characteristics of the record. These include: (1) label and manufacturer, (2) alpha-numeric symbols, (3) format (cylinder, tape, disc, etc.) -- these could also specify track configuration for tape, or lateral versus vertical for discs, (4) composition of recording (wax, shellac, vinyl, acetate, etc.), (5) playback speed, (6) significant dimensions such as diameter and thickness, (7) selection title(s), (8) artist(s),

(9) composer(s), (10) production data, such as original recording facility, engineer and producer, (11) liner notes, and (12) unusual markings or characteristics.

All this information is necessary to catalogue the original record and to assure researchers that the re-recordings have been properly identified. Though it may seem impractical to compile this data for an entire collection, investigation into data collection and retrieval initiated by the Syracuse University Archive has led to a successful micrographic technique that indicates the process can be efficient, economical, and help preserve the records. But that is a subject unto itself.

With the record properly identified, the second standard is to use the proper playback equipment. Since the purpose of audio history preservation is to first hear how records originally sounded to the general public, the original equipment that gives optimum reproduction should be used. If it is not possible to find such equipment, then whatever system is used to reproduce the record should be described and justified. The standards for such an alternate system could be established by consensus of the IASA Technical Committee and archivists.

The third standard for preserving audio history is the selection of the appropriate re-recording process based on whether a record was originally intended to be played with or without electronic amplification. For those records originally played without electronic amplification, the only acceptable means of capturing the sound is to use a calibrated microphone in the re-recording process. The distance of the microphone from the transducer and the average sound pressure level should be noted. Furthermore, the re-recording should be done in a controlled acoustic environment where the influence of room acoustics is negligible on a reproduced signal.

On the other hand, records originally reproduced with electronic amplification should not use a microphone but a phono cartridge to interpret the sound. These re-recordings should be done as "straight" dubs. As previously mentioned, "straight" dubbing implies the use of the manufacturer's recommended playback curve. "Flat" dubbing, or the use of non-equalized preamplification, would be applied in this context only if it was the designated "curve". "Flat" dubbing without regard for designated curves could be used for comparative analysis but re-recordings generated in this fashion should indicate that fact.

Other than using controls to re-create the manufacturer's intended playback curve, no signal manipulation by equalizers, filters, reverberation devices, etc., should be permitted. An exception to this might be "pop" and "click" suppressors that can be shown to attack and eliminate only those defects.

The fourth standard is that all equipment used for transferring the original sound to a storage medium, such as tape, be precisely calibrated. Documentation of the system's response should be kept in order to define its inherent limitations. At least the following documentation should be required: (1) the playback and record response of tape decks with reference to Ampex or other standard alignment tapes; (2) frequency response test of the composite system based on real time spectrum analysis of pink noise through the system; (3) the system's signal-to-noise ratio; (4) distortion characteristics, and (5) re-recordings should include reference tones, as specified by IASA.

The fifth standard for preserving audio history involves one of the most controversial topics in audio -- the standardization of the playback monitoring system. The selection of a playback monitoring system, more often than not, is a matter of personal taste. But choosing a speaker that you prefer, and not one that is calibrated to a standard, is a luxury no archivist can afford. Given the definition of audio history sound preservation stated earlier, the re-recording should be able to withstand a direct A-B comparison test with the original recording. That is possible only when the loudspeaker playback system is linear with respect to the input signal. Bad recordings will sound bad, good recordings will sound good, and that is as it should be. The trained human ear is not being demeaned here, it is a strong asset, but without a standardized playback system conclusions regarding the recordings can only be considered opinions.

Today's recording companies, artists, producers, and engineers are using multi-track recorders, over-dubbing techniques, and all kinds of electronic gadgets to manipulate the sound: the final product's relationship to reality is often of little or no concern. For an audio engineer in an archive fifty years from now to try and guess what these records were supposed to sound like, without the use of a standardized monitoring system, will be an exercise in guesswork, not unlike the situation we have today.

Therefore, IASA should try to do what the recording industry has not done -- establish a standard playback system. The quality should be as high as reasonably possibly and should be a standard by which all recordings can be evaluated. The hope is that such an action may influence the industry to follow suit.

Ideally, (1) all archives should have a control room of the same size and acoustic treatment, (2) all amplifiers and speakers should be the same, (3) calibrated to a standard, and (4) similarly positioned. Realistically, that probably will not happen but it is certianly reasonable to expect that a re-recording laboratory meet the following requirements.

The monitoring system's frequency response should be within ±2 db, at a specified sound pressure level, of an IASA recommended curve. This curve should be consistent with the goal of output equaling input. Likewise, the control room acoustics should be maximized for accurate reproduction. Noise criteria levels should not exceed 25 db, and the sound should be diffused with a minimum of echoes and standing waves. As with all other calibrated components, the response of the speaker monitors within the control room should be documented.

The one element that can simplify the standardization of a monitoring system is the selection of a reference speaker. IASA should specify one, and only one, speaker as the standard reference speaker. Other speaker brands and models that exhibit the desired characteristics for frequency, distortion, and transient response could be listed and used as a proximity of the reference speaker but not as a substitute. The speaker should be of high quality, have a basically "flat" response curve, and be affordable to the average archive.

Reference speaker, as the name implies, should be the speaker *referred* to for comparative analysis. Of course, disagreements about which speaker is the best to use are inevitable. However, the association can avoid a time-consuming debate by stipulating a finite period in which to consider all the possibilities, before rendering this very important decision.

One possible approach might be to form a committee specifically charged with the responsibility of implementing a procedure to gather all relevant information necessary to reach a concensus. Committee members could include one sound engineer from each archive actively engaged in re-recording. Additional members could be recruited from the standards committee, or officers of the Audio Engineering Society.

The standards listed so far have been for Type I re-recordings, whose purpose is the preservation of audio history. Briefly stated they are: (1) the identifying characteristics of a record should be indexed; (2) a record should be played back on the originally intended machine; (3) the re-recording process used should be a direct function of whether the original playback system did or did not use electronic amplification; (4) the equipment used to make the new recording should be precisely calibrated; (5) archives should use one standardized reference speaker.

STANDARDS FOR THE PRESERVATION OF THE SOUND OF ARTISTS

The knowledge acquired through audio history preservation provides the sound engineer with a logical place to begin the next step -- the search for the "true" sound of an artist. Again, the preservation of the sound of an artist, referred to as Type II re-recording, is based on the goal of perpetuating the "live" sound of the original performers. Therefore, the obligation of the re-recording engineer, in this case, is to the artist and not necessarily to audio history.

The basic obstacle to this quest is that, in most cases, the performers are no longer available to make a live versus recorded sound comparison test. This does not mean that one interpretation of re-recording is as valid as another, quite the contrary. Only those re-recordings that can meet, at least, the following standards should deserve archival consideration.

The first three standards were incorporated in audio history sound preservation and are equally applicable here. They are: (1) the use of the indexing procedures, (2) the calibration of the equipment used to make new recordings, and (3) the use of the standard reference speaker.

What truly distinguishes Type I from Type II re-recordings is the fourth standard. Compliance with this standard requires dedication as well as some sophisticated audio equipment but if it is adhered to the results should be worth saving for posterity. That standard is: re-recording processes that are attempting to re-create the live sound of an artist may use playback equipment other than that originally intended so long as the researcher proves that the process is objective, valid, and verifiable.

For example, if a cylinder is to be reproduced with an electronic pickup, the playback specifications of this hybrid system should be documented. With such documentation, the process could be accurately repeated allowing the results of one trial re-recording to be verified by others. As a researcher develops new techniques, or compares his results with others, an accumulation of the data should eventually lead to a definition of characteristics -- those of the artist compared to those of the original recording medium. The ability to make this differentiation is what would establish the validity of a re-recording process, and should be mandatory for any re-recording process that professes to re-create the live sound of an artist.

Not until a researcher makes this distinction can devices such as filters, equalizers, and delay networks be employed legitimately in a final re-recording process. Totally subjective implementation of such equipment is not a valid approach for discovering the truth of an artist's voice, and must be discouraged. What is desirable is to extract a better signal than the original reproducing equipment was capable of producing, and to minimize noises that were inherent in the system or have been caused by aging or abuse. Once the noises and anomalies have been scientifically determined and documented, selective filtering and equalization can then be used far more objectively. This does not mean that you will necessarily like the way the record sounds, but it does establish a foundation on which to begin constructing a playback curve that better approximates reality.

In keeping with this theory, the re-recording laboratory should photo-document the spectral response of a record over a period of time (Δt), prior to processing, and then repeat the analysis after processing. Superimposition of the two events should give a clear and concise picture of the changes that were made. It is hoped that this will result in conclusions based on fact and will discourage manipulation of sound based solely on one's hearing or one's biases. Since the net effect of many of the changes would now be identifiable, isolated victories could become repeatable re-recording strategies.

CONCLUSIONS

In summary, audio archivists must recognize that preservation of the sound within records deserves their highest priority. Processes used for this purpose should be accurate, verifiable and objective, in order to establish an authenticity. Two types of interdependent re-recording standards have been proposed. Type I -- Audio History Sound Preservation which would result in re-recordings faithful to the best audio reproduction of a record during its era. Type II -- the Sound Preservation of Artists which would attempt to re-create the live sound of the performers. Special attention was also given to the establishment of a standard reference monitoring system.

One of the greatest pleasures in listening to records is the personal pleasure and meaning one derives from the sound. We as sound archivists must be careful not to impose our perceptions on those listeners through biased re-recordings. We must establish and abide by standards.

BIBLIOGRAPHY

Carneal, Robert B., "Controlling Magnetic Tape for Archival Storage," PHONOGRAPHIC BULLETIN, no. 18, (July 1977), pp. 12-14.

Eckersley, Timothy, "The Future of the IASA: A Personal View," PHONOGRAPHIC BULLETIN, no. 7, (July 1973), pp. 1-5.

Kahlenberg, Dr. Friedrich P., "Sound Recording in the Bundesarchiv," PHONOGRAPHIC BULLETIN, no. 20, (April 1978), pp. 4-10.

Knight, G. A., "Factors Relating to Long Term Storage of Magnetic Tape," PHONOGRAPHIC BULLETIN, no. 18, (July 1977), pp. 15-45.

Read, Oliver and Walter L. Welch. From Tin Foil to Stereo. Indianapolis: Howard W. Sams & Co., Inc., 1976.

Schüller, Dr. Dietrich, "Towards a Standard for Exchange Tapes Between Research Sound Archives," PHONOGRAPHIC BULLETIN, no. 16, (Dec. 1976), pp. 36-37.

Tainsh, Karin Beskow, "The Sound Archives of Sveriges Radio," PHONOGRAPHIC BULLETIN, no. 16, (Dec. 1976), pp. 7-11.

Welch, Walter L., "Thomas Alva Edison Foundation Re-recording Laboratory at Syracuse University," PHONOGRAPHIC BULLETIN, no. 2, (Jan. 1972), pp. 21-23.

Zahn, Wilfried, "About the Reproduction Problems of Edison Cylinders," PHONOGRAPHIC BULLETIN, no. 21, (July 1978), pp. 28-29.

Zahn, Wilfried, "Preservation and Storage of Tape Recordings," PHONOGRAPHIC BULLETIN, no. 15, (July 1976), pp. 5-6.

ERHARD ASCHINGER
Phonogrammarchiv der Österreichischen Akademie der Wissenschaften

REPORT ON MEASUREMENTS OF MAGNETIC STRAY FIELDS IN SOUND ARCHIVES

INTRODUCTION

One of the big advantages of magnetic tape over any other recording medium is that the stored information can be erased and the tape used over and over again. However, if tape is to be used as a permanent store of information, as in a Sound Archive, this property is a very big disadvantage indeed. It would be fine if one could -- by some still unknown process similar to that of fixing a photographic picture -- freeze the once recorded sound for good.

Aside from the complete erasure which can be considered the extreme case, the magnetic inscription on tape can be influenced by a number of factors: humidity, fungus, chemicals, age, print-through, etc., but also, and perhaps most dangerously, by external magnetic fields.

The influence of AC and DC magnetic fields on stored tape has been investigated thoroughly by G. A. Knight and others, who especially studied print-through, partial erasure, increase in distortion and noise, etc., by external fields originating from electric machines, strokes of lightening, and the like.

G. A. Knight in his paper suggests that a value of 25 Oe (not distinguishing between AC and DC) may be accepted as a level "below which very little degradation is likely to occur". However, no information is given on the degree of degradation found acceptable. Also, there appears to be no literature on what happens to tape being moved through a magnetic stray field.

We at the Phonogrammarchiv came across this question when we discovered that many technical devices used in a studio exhibit quite strong magnetic stray fields -- in fact, even tape recorders of prominent manufacture show field strengths which first shocked us and then prompted a closer study. The question is, what happens to a pre-recorded tape travelling through a magnetic field, AC or DC, of, say, 5 Oe, or 50 Oe, or more.

ASSESSMENT OF STRAY FIELDS

To get an idea on what is involved, we started by assessing the magnetic stray fields of objects and equipment typically used in a Sound Studio or Archive. The measured values are tabulated in the Appendix. All test objects were tested for AC and DC fields. Where there is no entry for one of these it was non-existent, or negligible, that is, below 0,5 Oe.

In all DC measurements, the magnetic field of the earth was not compensated for (this would have complicated the measurements unnecessarily), so there is an uncertainty of ±0,4 Oe which we found acceptable for our purpose.

From the table it can be seen that all pieces of equipment incorporating permanent magnets exhibit strong DC stray fields, i.e., loudspeakers (especially small ones), dynamic microphones,

dynamic headphones (Beyer DT 48), moving-coil instruments, etc. AC stray fields originate of course from power transformers in mains-operated equipment (including tape recorders).

INFLUENCE ON RECORDED TAPE

Our next concern then was to assess the effect of stray fields on tape moving on a tape recorder or tape winder, and especially, find a maximum permissible value of field strength below which no deterioration occurs.

What we were looking for in our tests were partial erasure or loss in playback level, increase in distortion, increase in noise, and, ultimately, recording of the stray field onto the tape.

Depending on its source, a magnetic stray field can take many forms from a very homogenous one (from a distant source) to a rather sharply focused one (from a source near or in the tape machine). As the latter case was thought to be most detrimental, and as we deliberately wanted to establish the worst case conditions, we decided on a test setup where the stray field in the tape path was generated by an iron-core inductor with a large air gap of some 7 mm. Also, again looking for the worst case, we found that stray fields perpendicular to the tape surface had the largest effect.

Our tests were carried out using a Nagra 4.2L tape machine and Agfa PE-46 tape, since it was our aim to test a tape right in the middle of the coercitivity range to obtain typical results which would also be of significance for other tapes. Pure sinewave signals of different frequencies and magnetization levels were recorded, and the tape subjected to a calibrated stray field during playback. Playback level and waveform were monitored by an rms voltmeter (weighted or unweighted), an oscilloscope, and a distortion analyzer.

However, it soon became clear that it was not possible to obtain conclusive results that way. After getting some very puzzling test results we decided to analyze the playback waveform on a spectrum analyzer and there we found the reasons for the misleading test results using conventional equipment. Also, the spectral analysis proved extremely instructive, and in some cases surprising.

It would exceed the scope of this report to give details on all the many tests we made. They can be summarized as follows:
DC stray field: increase in low-frequency noise starting at 50 Oe, loss in playback level starting at 100 Oe, no appreciable increase in distortion up to 200 Oe;
50 Hz AC stray field: partial erasure of original signal, and recording of 50 Hz stray field starting at 10-50 Oe.

It is interesting to note that the stray field is recorded not only in the form of the 50 Hz fundamental and its harmonics, but also in the form of sidebands around the originally recorded signal and its harmonics. The number and amplitude of these sidebands increase with increasing stray field strength, and their effect is clearly audible even for stray fields as low as 20 Oe.

Much to our surprise we found that small stray fields between 10 and 50 Oe add 50 Hz sidebands to the even-numbered harmonics of the original signal only (Fig. 1a-d). The mechanism causing this peculiarity is not yet fully understood and there is some evidence that it may in part be

due to the form of the magnetic field used in the test setup. Further work will be necessary to find a satisfactory explanation. It should be noted that all tests were made using 50 Hz power line frequency fields as these are most commonly encountered in practice (60 Hz in the USA will give similar results). Magnetic stray fields of higher frequency are most unlikely in a studio.

WARNING LABEL

As our study has shown that already rather weak stray fields can harm archival tapes, and that these values are within the range exhibited by equipment used in a studio, it would seem wise to have some safeguard against any "magnetic accidents".

Therefore, we propose to establish a new warning label to be attached to any piece of equipment liable to emit magnetic stray fields, similar to the well-known radioactivity warning label. It should show a universally understood symbol for a magnet, and should indicate the nature of the field, AC or DC, and give the worst-case 5 Oe-distance or enveloping radius in mm.

CONCLUSION

It has been shown that magnetic stray fields as low as 10 Oe AC or 50 Oe DC can cause permanent damage to recorded magnetic tape. Including a safety factor of 2, it is recommended to keep tapes safely away from fields exceeding 5 Oe AC or 25 Oe DC.

In practice, special care must be taken with carrying cases housing tape recorder, recorded tapes, dynamic microphones, and dynamic headphones adjacent to each other. On the other hand, loudspeakers (except those in miniature enclosures) are not nearly as dangerous as has been thought up to now. Also, the AC and DC stray fields found in the tape path of tape recorders can be considered harmless, they could, however, easily be avoided completely by proper design of the machine.

This paper was presented at the IASA Technical Committee Session in Salzburg, and some very interesting suggestions were made in the discussion period which focused on magnetic hazards to tape during transport. These problems will be dealt with in a subsequent report which we hope will also include data on metal detectors, magnetic gates (in airports, etc.) electric trolleys, fork lift trucks, electric railways, air freight, etc.

ACKNOWLEDGEMENTS

Dipl.Ing. Franz Lechleitner (Phonogrammarchiv der Österreichischen Akademie der Wissenschaften) for invaluable help with measurements;

Dr. Werner A. Deutsch (Kommission für Schallforschung der Österr. Akademie der Wissenschaften) for doing the spectral analyses;

Institute für Allgemeine Elektrotechnik der Technischen Universität Wien, for assistance in instrumentation.

BIBLIOGRAPHY

G. A. Knight: "Factors Relating to Long Term Storage of Magnetic Tape," PHONOGRAPHIC BULLETIN, no. 18, (July 1977), pp. 15-35.

* * * * *

APPENDIX

Test Objects: various pieces of equipment usually found in a Sound Archive were tested for magnetic stray fields; where necessary, explanatory remarks are given.

Measured Values: H, Magnetic Field Strength (AC or DC) in Oersteds, measured on the surface of the test object (unless mentioned otherwise). Note: 1 Oe = 80 A/m.

D, Distance in mm from test object surface where measured field strength is 5 Oersteds.

Test Equipment: Bell Inc., Model 640 Incremental Gaussmeter

TEST OBJECT	REMARKS	H (Oe)	D (mm)
a) Loudspeakers			
TANNOY Arden	front	19	150
	back	17	130
	side	3	
	top	5	
TANNOY Berkeley	front	20	150
	back	36	150
	side	4	
	top	1	
ACRON 100C	front	150	120
	back	60	120
	side	50	100
	top	160	80
B & O Type M	front	30	20
	back	1	
	side	1	
	top	1	
b) Microphones			
AKG D19	front	90	30
	side	30	12
AKG D900	side	30	12
AKG D190	front	40	20
	side	13	5
AKG D58	front	30	12
	side	12	10

TEST OBJECT	REMARKS	H (Oe)	D (mm)
AKG D160	front	80	20
	side	30	15
AKG D24	front	15	15
	side	30	10
c) Tape Recorders			
STUDER B67	max. AC	0,5 AC	
	int. loudspkr., top surface	30	
	in tape path	7	
	pinch roller sol., top surface	15 DC	
	in tape path	7 DC	
STUDER B62	pinch roller sol., top surface	10 DC	
	in tape path	6 DC	
STUDER A67	pinch roller sol., top surface	11 DC	
	in tape path	5 DC	
	VU-meters	20	6
REVOX A77	pinch roller sol., top surface	20 DC	
	in tape path	10 DC	
NAGRA 4.2	int. loudspkr., top surface	8	
	in tape path	5	
	side	15	20
Stellavox SP7	int. loudspkr., top surface	8	
	in tape path	5	
	power supply	1 AC	
Tandberg Type 11	int. loudspkr., top surface	20	20
	in tape path	5	
UHER 4000IC	int. loudspkr., front	20	30
	in tape path	12	
d) Headphones			
KOSS Pro-5 LG	inside	100	50
	outside	20	20
KOSS ESP-9 (electrostatic)	power supply	10 AC	
AKG K240	inside	100	25
	outside	20	5
AKG K140	inside	45	20
	outside	25	10

TEST OBJECT	REMARKS	H (Oe)	D (mm)
BEYER DT48	inside	230	70
	outside	150	70
	side	80	50
e) Miscellaneous Equipment			
Bulk Eraser LEEVERS-RICH			
	in tape path (10,5" reel)	600-800 AC	150
	bottom	10 AC	100
	sides	10 AC	100
Hand-Held De-Magnetizer Type 1	tip	800 AC	
	shaft	400 AC	
	handle	500 AC	
	back	1500 AC	150
Hand-Held De-Magnetizer Type 2	tip	600 AC	
	back	1000 AC	120
Welding Transformer			
Model PROMETHEUS, 1,8 kVA	idling	40 AC	100
	short circuit	400 AC	500
Desk-Top Telephone	back of receiver	22 DC	30
	left side of case	4 DC	
PPM Instruments, Ernest Turner	front	100 DC	50
Mixing Console (FELS)		0,8 AC	
Mixing Console (Custom)		0,5 AC	
Tone Generator (Heathkit)		3,0 AC	
Tone Generator (Custom)		0,2 AC	
Universal AF Filter		5,0 AC	
Pre-Amplifier (QUAD)		0,6 AC	
Power Amplifier (Kenwood)		0,5 AC	
Power Amplifier (Custom)		0,5 AC	
Multimeter UNIGOR 6e	top	70 DC	60
	side	15 DC	50
	bottom	10 DC	10
60 W Fluorescent Lamp	near int. choke	2 AC	
Typewriter IBM		0,8 AC	
Typewriter OLIVETTI Editor 3	top	1,5 AC	
	bottom	3,0 DC	

Figure 1: Spectograms of prerecorded tape subjected to AC stray field during playback.

Parameters: recorded test frequency 1 kHz with harmonics
record level o dB
tape machine NAGRA 4.2L
tape Agfa PE 46
stray field 50 Hz AC, sinusoidal

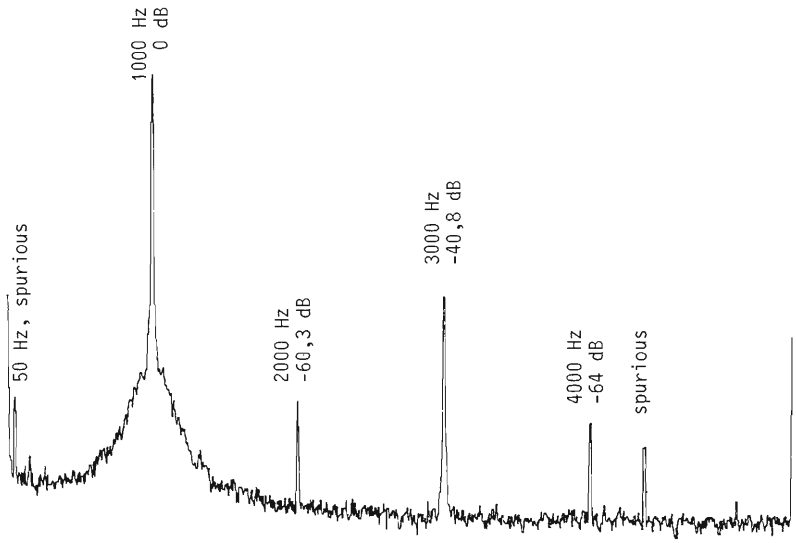

Fig. 1a: stray field 0 Oe

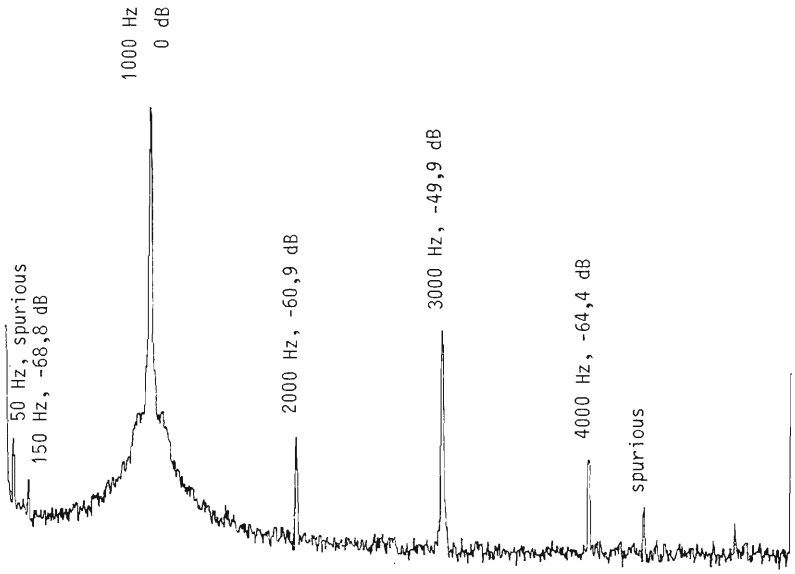

Fig. 1b: stray field 10 Oe

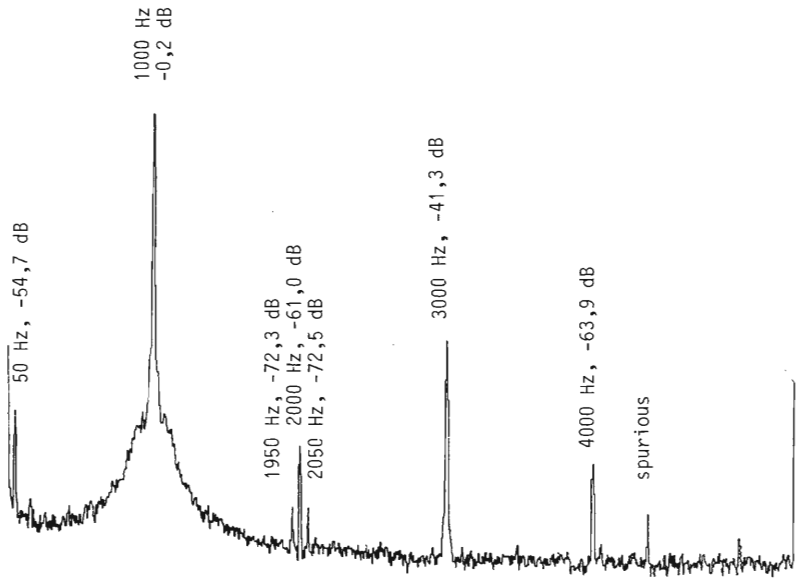

Fig. 1c: stray field 20 Oe

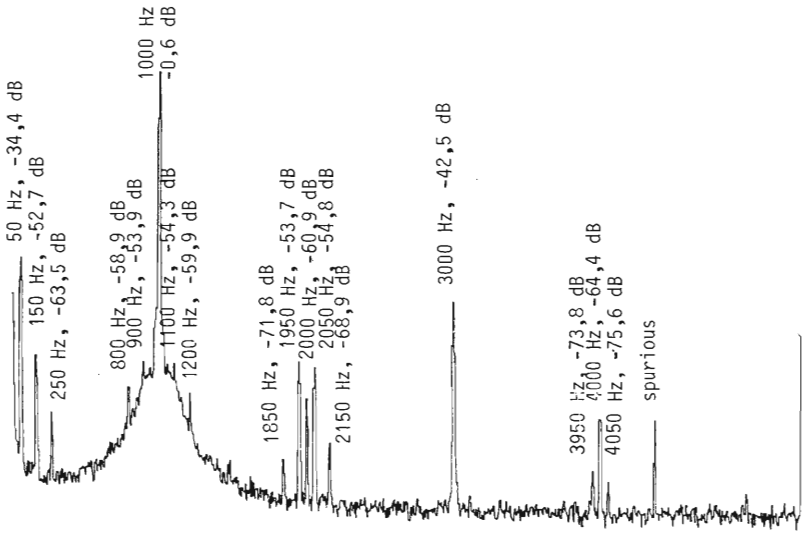

Fig. 1d: stray field 50 Oe

DIETRICH SCHÜLLER, Chairman IASA Technical Committee

ARCHIVAL TAPE TEST

The decision to undertake a comparative test on tapes usually recommended for long term storage was made by this committee during the Mainz Annual Meeting in 1977. A preliminary report was given at the Lisbon Meeting in 1978. This final paper is based upon measurements carried out by Lloyd Stickells, Imperial War Museum[1], London, Wilfried Zahn, Deutsches Rundfunk Archiv, Frankfurt, and Franz Lechleitner and Dietrich Schüller, Phonogrammarchiv, Wien. Valuable advice and assistance has been received from Tonko Tonkes, Gemeentelijke Archiefdienst, Rotterdam, Robert B. Carneal, Library of Congress, Washington, D.C. and Erhard Aschinger, Wien. The author acts mainly as an organizer and reporter.

The choice of magnetic tape used in a sound archive for long term storage is undoubtedly one of the most important factors in sound preservation. While there is general agreement to use standard play tape (thickness 52 µm) with polyester base[2], a wide variety of such tapes from different manufacturers with different electro-magnetic properties are used worldwide. In many cases the decision to use a specific tape seems to be based upon tradition, personal recommendation and availability rather than upon intimate knowledge of a variety of products, simply because comparative tests are time-consuming and data published by manufacturers are by no means always comparable -- especially not across the Atlantic! Furthermore, publications of data for 19 cm/s (7.5 ips) are rare exceptions[3]. The Technical Committee, therefore, has decided to undertake a comparative test amongst several tapes, which are recommended and used for long term storage at the speed of 19 cm/s. These tests were undertaken independently by the laboratories of the three mentioned sound archives. The test samples of all tapes were taken from the same reel and distributed to all laboratories. While most tapes were bought, the samples of BASF LGR 30 P and SPR 50 LH were submitted by the manufacturer. The test conditions within the individual laboratories remained the same thus making the results comparable within the test series, but, due to different methods and equipment, different figures were obtained by the three laboratories. The tendency, however, proved to be more or less the same. For simplicity's sake the Technical Committee agreed to publish only one test series -- that of the Phonogrammarchiv, which is the basis for table 1[4].

DISCUSSION OF THE RESULTS

Bias Setting: Contrary to practice in other comparative tape tests, it has been felt that not general but only individual "overbiasing" would do justice to the various tapes. But trouble started here simply because only a few manufacturers publish data sheets on tape performance relative to bias setting for 19 cm/s. On the other hand the American method of "overbiasing" at 1 kHz is so undefined that it leaves too many possibilities open. We therefore followed the recommendations which in most cases were obtained through personal communications with representatives of tape manufacturers. In the case of no recommendation, we adopted a value found after short experiments[5]. The results show that it might be worthwhile reconsidering the bias setting for optimum performance for one's individual requirements. This is suggested for instance by the figures for Racal Zonal 666 where quite high distortion figures made us try a higher bias setting (-6 dB) giving the results one would expect. Perhaps Racal Zonal "low print" will behave similarly. On the other hand, Agfa PER 525 and BASF LGR 30 P should, according to specifications of the German Radio, behave equally. We suspect that PER 525 will show lower distortion figures with still acceptable high-frequency response when overbiased by

7 dB. The second column shows the bias current values relative to the current used for Agfa PER 525. The figures are only an indicator for tendencies as they would differ from machine to machine.

Sensitivity and Distortion: The figures give the sensitivity at individual bias, relative to Agfa PER 525 at a level of -20 dB relative to 320 pWb/mm track width (nominal level). As with other values over-interpretation should also be avoided in this case. Distortion was measured at individual equalization of frequency response, selectively for k_3 at 1 kHz at nominal level. Additionally, the 1% and 3% k_3 points are given in dB relative to our nominal level[6]. Where relatively high values coincide with good high frequency sensitivity more bias might be advisable. Racal Zonal 666 is a good example.

Bias Noise: Bias noise was measured relative to nominal level: 1) linear 20 Hz to 20 kHz, RMS ("Fremdspannungsabstand"); 2) weighted to DIN 45 405, quasi peak rectification ("Ruhegeräuschspannungsabstand"); and 3) A-weighted RMS, corresponding to a widely common American practice. Signal-to-noise ratio was calculated between the level of 3% k_3 and bias noise ("Ruhegeräuschspannungsabstand"). This column again makes it convincingly clear that values have to be seen in their intercorrelation; Scotch 208 for example having highest distortion at nominal level, still reaches an average S/N ratio due to extremely low noise figures. A tape of this type requires a judicious selection of recording level.

Print: A 1 kHz signal was recorded at least three times per test sample at nominal level. After recording, the tape remained on the take-up reel at approximately 20° C for 20 hours. Replay was started from the tail of the tape avoiding fast back winding and measurements were taken through a band pass with a 24 dB/octave slope. The average values are given in terms of "high" and "low"[7]. The tapes were then wound three times[8] and stored for an arbitrary number of 226 days without temperature control but within the range of 19° C to 23° C. Then the test procedure was repeated. The table shows the values of the first run after 226 days without fast winding and what was left of them after three times of fast winding on a STUDER B 62. It should be noted that only minimal rises (maximum 2 dB) are noticeable between 20 hours and 226 days, whereas the figures came down to the 20 hour's values at least, if not lower, after three times of fast winding. This convincingly shows that the increase of the print signal after a relatively short time is only marginal. It suggests furthermore that everything should be done to keep the initial print signal as low as possible. It is important therefore to keep the surface of the tape machines as cool as possible, to avoid warm lamps in their vicinity and to give utmost care to the absence of magnetic stray fields on the surface of tape machines[9], as a small print signal in the beginning of the life of a recorded tape seems to be constitutional for its future value. It would also be advisiable to wind the tapes in regular intervals (1 year) three times (this makes it possible to come back to the same reel already labelled). This alternative tails-in -- tails-out storage would keep the print values at least at their 1-day levels, while the rest of the print -- due to its new neighbourhood in the other storage mode -- vanishes. The newly built up print will be treated in the same way after one year.

Fast Winding: The fast winding properties were observed on a comparatively fast winding STUDER B 62. In the case of Scotch 208 poor results were observed with winding inside an almost closed NAB reel, while good performance was obtained on a free hub. We suspect that this results from too much air being trapped during the fast winding mode which will not occur at slower winding speeds.

Conclusions: Although new tapes have turned up in the meantime, the results of this test are still very informative in general. They concentrate on the remarks concerning bias setting and print. It seems to be advisable to put more weight on a careful bias setting and, if ultimate storage quality is the object, to reconsider measures against print. This effect, however, has lost -- as we think -- most of its frightening aspects. It must be emphasized that all measurements are valid only for the sample taken. The consistency of the tape properties from reel to reel and from batch to batch cannot be included in a test like that. It is therefore recommended to buy large quantities at a time and to ask the manufacturer to deliver a batch with properties in the middle of the production range.

To conclude: None of the tapes is a total winner or loser. Tendencies towards tapes combining low noise-high output qualities with low print are noticeable but the choice of the right tape will always have to be a compromise between performance, availability and price.

FOOTNOTES

1. Lloyd Stickells now is with the British Institute of Recorded Sound, London.

2. See IASA Technical Committee: Standard for Tape Exchange between Sound Archives. In PHONOGRAPHIC BULLETIN 19/Dec. 1977.

3. For other comparative tape tests see: Angus Mckenzie: Recording Tape. In Studio Sound, February 1975. Hugh Ford: Magnetic Tapes. In Studio Sound, August 1977.
While test data are obtainable for 38 cm/s, the speed of 19 cm/s is widely used in sound archives. IASA's Technical Committee tries to fill in this gap without expressing a preference for this lower speed.

4. The following equipment was used for this test:
Tape recorder: Studer B 62, full track, recording head gap 7 µm
Studer B 67 (for noise measurements only)
Calibration tape: Agfa DIN 19s (70 µs) No.7100
Voltmeter: Sennheiser RV 55 with filter FO 55
Distortion analyzer: Radiometer BKF 10

Although great care has been given to making the test as accurate as possible, it should be noted that the test results are no absolute values, necessarily comparable with data published by manufacturers or obtained by measuring under even slightly different conditions. Above that human error cannot absolutely be excluded. IASA, the Technical Committee and the author therefore decline any liability in case of disagreement.

5. Extensive measurements would have been too time-consuming.

6. Distortion figures at nominal level are slightly lower when using, for instance, a Studer B 67. The B 62 has been preferred, however, due to its better bias adjustability. To get more realistic values, a B 67 was used for noise measurements.

7. We prefer to indicate "high" and "low" rather than "pre-" and "post-print", as this nomenclature becomes unclear in the case of "tails-out" storage. It should be remembered that the print-signal on the tape layer outside of the mother signal is stronger ("high") than that on the inside layer ("low").

Print figures have been omitted on tapes joining in later as uncontrollable test-conditions may disturb the reliability within one test series. Strictly taken this possible shortcoming is valid also for the measurements between 1 and 226 days. Here again interpretation of 1 dB should be avoided.

8. In order to avoid confusion we deliberately did not publish these results here too. In most cases they come down to values which are hardly measurable because of their closeness to noise.

9. See Erhard Aschinger: Report on Measurement of Magnetic Stray Fields in Sound Archives. In PHONOGRAPHIC BULLETIN 27/July 1980.

TAPE	Bias (dB)		Sensitivity rel.525(dB)			k_3 rel. 320 pWb/mm			Bias noise (dB)			S/N	print-through (dB)			winding
	E 10 kHz	rel. 525	1 kHz	10 kHz	15 kHz	0 dB (%)	1 % (dB)	3 % (dB)	linear RMS	DIN peak	"A" RMS	(dB)	1 day high low	226days high low	226days after 3 times winding	
Agfa PER 525	-6	0	0	0	0	0,7	+2	+6	-59,8	-54,0	-63	60	-60,5 -65	-60 -65	-66 -70	excell.
Agfa PEM 468	-6	+2	-0,3	+1,7	+2	0,4	+4,9	+9,3	-61,4	-56,9	-65,6	66,2	-60,7 -65,7	-59 -65	-64,5 -68,5	good
BASF LGR 30 P	-7	+0,3	-0,3	-0,8	-1	0,5	+3,3	+7,3	-61,3	-55,1	-64,3	62,4	-63,5 -68,8	-61 -67,5	-63,5 -68,5	excell.
BASF SPR 50 LH	-5	+0,2	+0,1	+3	+4,5	0,3	+4,7	+8,6	-61,8	-57,2	-65,8	65,8	-57,5 -62,8	-55,5 -61	-57 -62	good
BASF SP 54	-5*	-0,1	-0,5	+2,8	+4,4	0,5	+3,2	+7,2	-63,0	-57,7	-66,5	64,9				
Racal Zonal "Low Print"	-4	-0,5	-0,7	+2,5	+3,7	1,4		+3,7	-60,4	-55,7	-63,7	59,4				
Racal Zonal 666	-4 (-6)	-0,8	-0,7	+1,6	+2,9	1,2 0,9	+1,3	+5,4	-61	-55,2	-64,2	60,6	-62,8 -67,6	-62 -67,5	-66,5 -69,5	excell.
Ampex 406	-5.5*	-0,25	+1,5	+4	+4,9	0,5	+3,6	+8	-60,9	-56,4	-64,4	64,4	-58,6 -62,1	-57,5 -62	-64 -66	fair
EMI 815	-4	-1,3	+0,5	+2,5	+3,8	0,8	+1,8	+6	-62,6	-57,3	-66,4	63,3	-56,3 -60,2	-54 -60	-58 -62	fair
EMI 816	-4	-0,6	-0,2	+0,5	+1,3	0,8	+1,5	+5,6	-62,2	-57	-66	62,6	-61,5 -65	-60 -65	-63 -67	excell
Scotch 256	-5*	+1,3	-0,1	+1,2	+1,7	0,4	+5	+9	-62,4	-56,6	-65,4	65,6				poor
Scotch 262	-5*	+0,1	-0,8	-1,5	-1,5	0,9	+1	+5,2	-61,6	-55,8	-64,9	61	-63 -67	-61,5 -67	-66,5 -68	excell.
Scotch 208	-5*	-0,1	-1,3	0	+0,8	1,5		+3,4	-64,5	-59,7	-68,4	63,1	-56,4 -60,7	-54,5 -59,5	-58,5 -62	good - poor

* no recommendation received

table 1

COPYRIGHT COMMITTEE

Norbert Flechsig

THE PROTECTION OF BROADCASTING STATIONS AGAINST THE DISTRIBUTION OF BROADCASTS UNLAWFULLY COPIED IN A FOREIGN COUNTRY

I. LEGAL PROTECTION OF BROADCASTING STATIONS UNDER THE GERMAN COPYRIGHT ACT

In the Federal Republic of Germany, broadcasts in themselves are protected by a neighbouring right. Under Section 87 (1) of the Federal German Copyright Act, the broadcasting organization enjoys the exclusive right to rebroadcast its radio or television broadcast, fix its broadcast on visual or sound records, to reproduce such visual and sound recordings (reproduction right) and broadcast them. These provisions do not include an exclusive right to distribute such copies. Section 96 of the Act expressly prohibits the distribution of unlawfully made copies and their use for public reproduction or reception.

In imposing a general ban on public circulation for the benefit of all owners of copyrights and neighbouring rights, this rule provides broadcasting organizations in Germany with a high level of protection. Without it, for example, a broadcasting station would be unable to prevent the distribution of unlawfully copied broadcasts by parties who have not copied the broadcast themselves but sell the pirated copies. This negative right of distribution can be derived from Section 96 of the Copyright Act if the making of the copy is unlawful.

II. THE LEGAL PROBLEM

A copy is unlawfully made if the making is either unlicensed, and therefore unauthorized, or expressly prohibited by law.

1. If the copy is made in Germany, the broadcaster's protection against piracy is not problematic. It is simple enough to subject the right of reproduction to thorough scrutiny.

2. The position is exactly the same if the reproduction is distributed abroad but made in Germany.

3. If the recordings are manufactured in countries outside the Federal Republic of Germany and then imported or distributed abroad, it is doubtful whether a negative right of distribution subsists. This is a question of law to which there is no easy answer, and the protection of broadcasting stations depends on it. The negative right of distribution against domestic circulation of broadcast copies subsists only if the making of the copies in another country infringes upon foreign law. If not, it is questionable whether domestic law is sufficient to prevent the domestic circulation of copies of broadcasts made without authorization. In the following remarks an attempt is made to resolve this issue of law.

The decisions of the Federal German Court of Justice answer the complex questions surrounding the unlawfulness of the reproduction in the following manner. One important factor is whether the making of copies abroad is legal (i.e., under license) or illegal (i.e., pirated) according to foreign law. Fundamentally, the protection of German broadcasting against the unlawful reproduction of broadcasts in a foreign country, and their resultant domestic distribution, is only guaranteed if the foreign state stands up for the broadcasting organization.

The European Agreement on the protection of television broadcasts comes into play if the program is a television program. German broadcasting is equally protected if the foreign state is signatory to the International Convention for the protection of performers, producers of phonograms and broadcasting organizations (the Rome Convention) of 29 October 1961. If these international conventions are inoperative, either because the foreign state in which the pirated copies are made is not signatory to them, or the pirated broadcast copy is a radio program, I consider it imperative to have a wider and more adequate interpretation of Section 96 (1) of the German Copyright Act in the intendment of the law.

III. UNLAWFUL OPERATIVE CONCEPT (WITHOUT DOMESTIC AUTHORIZATION)

In answering the question of whether the operative concept is unlawful within the meaning of foreign law or as defined in the German Copyright Act, it is necessary to refer to the specific purpose of the legal protection granted by Section 96 of the Copyright Act. No third party is permitted to exploit the work of the broadcasting organization by rebroadcasting a broadcast or by recording it on a visual and/or sound medium and subsequently communicating it to the public. The broadcasting station would lose this legal protection even in the home country if Section 96 of the Copyright Act were falsely interpreted to mean that the existence or otherwise of reproduction rights in foreign countries controls the application of domestic law in Germany. If this were so the broadcasting station would be totally deprived of legal protection. Neither civil jurisdiction nor criminal prosecution would be granted by law, because in this event the domestic circulation of copied broadcasts would lack the requirement of unlawfulness.

Apart from the purposive explanation of the prohibitive use in question, the right of property established in Article 14 of the Basic Law of the Federal Republic of Germany can be interpreted to mean that copying in a foreign country without permission in the home country is unlawful, and circulation in the home country can therefore be prohibited. In this case the broadcasting rights are to be regarded as property within the meaning of the constitutional property right mentioned above. These broadcasting rights must have the same exclusive character as copyrights, and hence German broadcasting is able to restrain domestic circulation of copies of broadcasts unlawfully made in foreign countries.

To add a further comment on this point, broadcasting stations in Germany are also protected by general German civil law. First, such distribution in Germany of unlawfully reproduced copies of broadcasts must be qualified as an unfair competitive practice which imposes on the home stations' broadcasting right. Second, it must be regarded as parasitism because the German Copyright Act grants a broadcasting station positive protection against the reproduction and distribution of broadcasting copies unlawfully made in Germany.

The point at issue, whether this is unfair competition or not, must always be scrutinized in the light of existing regulations in the state where the distribution takes place. With regard

to distribution in Germany it is necessary to apply the Federal German Copyright Act in individual cases, even if the copies are made in foreign countries and without reference to the Act.

IV. PROTECTION OF BROADCASTING STATIONS UNDER DOMESTIC LAW, EEC TREATY AND PUBLIC INTERNATIONAL LAW

1. Protection against domestic distribution and European Unfair Competition Act

The European Economic and Commercial Treaty of 25 March 1957 requires member states to refrain from all measures which might jeopardize the realization of contractual aims and duties. Member states are also to refrain from imposing quantitative restrictions on imports and from all measures having equivalent effect. Furthermore, all agreements between undertakings which have as their object or effect the prevention of competition, and any abuse or by one or more undertakings of a dominant position, both within the Common Market, are prohibited. The question is therefore whether the domestic right of distribution under Section 96 of the Federal German Copyright Act offends against these rules on competition because this very right jeopardizes the economic aims of the European Community. If so, the importation of copies of broadcasts unlawfully made in foreign countries would not be prohibited in Germany.

Under Articles 30 and 31 of the EEC Treaty, European Community law guarantees every member state, and herewith every undertaking belonging to a member state, access to the Common Market. Quantitative restrictions which do not apply to both domestic and foreign goods are prohibited. The prohibition on use imposed by Section 96 (1) of the Federal German Copyright Act applies to domestic as well as to foreign reproductions of broadcasts. In accordance with this sounder interpretation, the Act protects the broadcasting organization against the unjustified distribution of such pirated broadcasts, irrespective of their national or foreign manufacture.

If this interpretation, according to which the provisions of Articles 30 and 31 of the EEC Treaty are not infringed, is not accepted, the domestic prohibition of distribution "is justified on grounds of the protection of industrial and commercial property" (Article 36 (1) of the EEC Treaty) and this prohibition does not "constitute a means of arbitrary discrimination or a disguised restriction on trade between member states". As long as the European Community has not compulsorily standardized the protection of industrial and commercial property, as long as only a few contracting states protect radio stations by a special neighbouring right, and as long as national differences in legislation prevent the free exchange of goods, the protection of broadcasting organizations, performers and producers of phonograms by a contracting member state (e.g. Germany) may affect "trade" in the Common Market. Otherwise a German Broadcasting organization, for example, would even be exposed to the importation of any copy of a broadcast unlawfully made in the Common Market.

The domestic negative right of distribution against copies of broadcasts manufactured abroad without authorization does not constitute a threat to fair competition within the Common Market. Articles 85 and 86 of the EEC Treaty prohibit the following: all agreements between undertakings and concerted practices which may affect trade between member states or abuse a dominant position within the Common Market. The transfer of exclusive use to broadcasting organizations is a normal condition. Accordingly, exclusive agreements are not measures which affect trade. Further, the claim to copyright is not an abuse of a dominant position within the Common Market. As has been seen, the domestic broadcasting stations cannot be

regarded as a monopoly, nor is the quantitative restriction on imports unnecessary and therewith unjustified. The position is quite the reverse, as the interpretation of Article 36 of the EEC Treaty has shown. A ban on the distribution of broadcasts pirated in European countries cannot be called incorrect or improper. European Community law does not stand in opposition to domestic (e.g. German) claims to prohibit distribution under Section 96 of the German Copyright Act or Section 1 of the German Unfair Competition Act. On the contrary, broadcasting organizations constituted in the territory and under the laws of Germany, or transmitting from Germany, enjoy in the territory of all parties to the EEC Treaty the exclusive right to authorize or prohibit any fixation of broadcasts and any reproduction of such fixation in the home country as well as within the Common Market.

2. Domestic protection of broadcasts and public international law

Finally, it is questionable whether national protection against the distribution of copies of broadcasts unlawfully made in foreign countries outside the European Common Market infringes upon international law. In this connection it should be recalled that the claim to provide legal protection for nationals and non-nationals corresponds to the principles of political and territorial sovereignty.

According to these principles, a sovereign state has the right to prevent foreigners from participating in economic activities in the absence of provisions to the contrary in bilateral or multilateral treaties. In particular, such measures are legitimate where they are intended to counter unfair competition and activities having a like effect on national broadcasting organizations. This protection against competitive encroachments on broadcasting stations and the rights of performers is also justified if the countries in which the unlawful copying takes place are not parties to the Universal Copyright Convention (UCC) and the Berne Convention for the protection of literary and artistic works.

V. SUMMARY

1. The express rights which the Federal German Copyright Act grants to broadcasting stations do not include an express right against the distribution of unlawfully reproduced broadcasts. Their exclusive right of reproduction protects them only against unauthorized reproduction of broadcasts in the home country. A negative right of distribution against the domestic circulation of copies of broadcasts made without authorization can be derived from Section 96 (1) of the Federal German Copyright Act. The need to protect economic products and the constitutional guarantee concerning the right of property argue in favour of this assumption.

2, Even if one takes the view that Section 96 of the Federal German Copyright Act does not grant a negative right of distribution, Section 1 of the Federal German Unfair Competition Act (UWG) grants the right to prohibit the relevant acts of distribution in the home country. Identical reproduction of broadcasts of radio stations, their redistribution by means of sound recordings and their consequential redistribution are parasitical on the work of another and afford grounds for an action for unfair and anti-competitive practices. Should these acts theoretically conform to foreign standards of fair competition, the impact of such distribution of illegal sound recordings would in any case directly affect the domestic market.

3. Legal protection against broadcasts unlawfully copied abroad is not a restriction on imports contrary to the principle of the free movement of goods under the EEC Treaty. The exercise

of related national rights cannot be regarded as an end or a means of a cartel agreement infringed upon European Community law. Claims based on negative distribution rights are not conducive to a dominant market position conflicting with these aims.

4. As regards extra-European states from which unlawfully copied broadcasts are imported, the owners of related rights are not required to tolerate such use either under bilateral or multilateral treaties or the general rules of international law.

THE VALUE OF THE SOUND RECORDING AS A SOURCE IN MUSICOLOGICAL RESEARCH

HELMUT A. MÜHLE, Sveriges Radio, Stockholm

DIE TONAUFNAHME IN MUSIKWISSENSCHAFTLICHER FORSCHUNG -- DISKUSSION ÜBER IHREN WERT ALS QUELLE (QUELLEN-KRITISCHE ASPEKTE)

(A presentation of the IAML/IASA Committee on Music and Sound Archives at the 1979 Salzburg conference.)

Ich halte eine Auseinandersetzung mit der Frage nach dem Wert der Tonaufnahme als Quelle für wichtig und kann in meiner Funktion als Musikproduzent und Aufnahmeleiter zur Klärung dieser Fragestellung vielleicht beitragen, indem ich zunächst erläutere, was für mich bei einer Tonaufnahme wichtig ist, welche Voraussetzungen erfüllt sein sollten. Anschliessend möchte ich mit Hilfe einiger kurzer Musikbeispiele zeigen, wie verschieden ein und diesselbe Komposition interpretiert werden kann und daran den Informationswert einer Tonaufnahme demonstrieren.

Die Frage, welche Kriterien bei einer Tonaufnahme erfüllt sein sollten, kann ich nicht objektiv behandeln, ich kann nur eine persönliche Stellungnahme abgeben. Ich beschränke mich dabei auf die Aufnahme sogenannter "klassischer Musik". Die Produktion von elektronischer Musik, Jazz, Pop und Unterhaltung hat teilweise andere Kriterien und Arbeitsmethoden, und somit würde die Antwort auf einige wichtige Fragen, wie zum Beispiel die Frage nach dem Einfluss der Technik auf die musikalische Interpretation, oder die Frage nach der Grenze technischer Eingriffe für diese Gebiete anders lauten.

Bei einer Aufnahme richte ich viel Aufmerksamkeit darauf, die technische Apparatur nicht wichtig werden zu lassen. Sie soll mit allen ihren Möglichkeiten in extrem hohem Niveau "da sein": also die gebotene Musikinformation über alle Glieder hinweg so getreu wie möglich speichern können; sie soll die Kunstfertigkeit des Schneidens, die Möglichkeit des Playback, die Ueberspielung auf Platte oder für den Musikfilm mit derselben Virtuosität und Kunstfertigkeit, die der Musiker im Aufnahmeraum leistet, anbieten können. Ich verwendete das Wort "Aufnahmeraum", weil für mich die Bezeichnung "Studio" unweigerlich mit Kompromissen und Zugeständnissen verknüpft ist: ich glaube nämlich nicht, dass es Räume gibt, die sich wirklich für die Aufführung von Musik aller Stile eignen. Nach Möglichkeit suche ich für eine qualifizierte Tonaufnahme Räume, in denen sich die Musiker mit dem zu interpretierenden Werk wohlfühlen. Meiner Erfahrung nach fallen dabei meistens die Wünsche der Technik mit denen des Musikers zusammen, mit anderen Worten trifft es selten zu, dass ein für den Musiker optimaler Raum nicht geeignet für die Aufnahme ist. Die Akustik des Aufführungsraumes spielt eine wesentliche Rolle. "Es ist überliefert, dass viele Komponisten die Raumakustik, den Nachhall, die Verschmelzungsfreundlichkeit

bestimmter Klänge in ihre Werke sozusagen einbauten, und viele Partituren des 17. und 18. Jahrhunderts -- ja sicher auch die Werke der Gotik und der Renaissance -- werden total missverstanden, wenn man diesen Punkt nicht berücksichtigt", um kurz Nikolaus Harnoncourt zu zitieren. Der Charakter und die Länge des Nachhalls und das Verschmelzungsvermögen von Klängen sind oft ein Kriterium für die Tempowahl und für die Wahl des Musikinstrumentes (ein Geiger wählt aus rein künstlerischen Gründen ein ganz bestimmtes Instrument für den Raum und das Werk, der Pianist -- wenn er die Möglichkeit dazu hat -- das geeignete Instrument). Wie soll ein Musiker inspiriert in einem Studio spielen, wenn man den Klang erst im Kontroll -- oder Regieraum mit technischen Hilfsmitteln manipulieren muss? Dass uns anschliessend das Resultat befriedigt, hat vielleicht mit der langjährigen Hörerfahrung und der Geschicklichkeit des Tonmeisters bzw. Toningenieurs und auch der technischen Einsicht des Künstlers zu tun, aber sicher auch mit Zufall und etwas Glück. Bei mir hinterlassen solche Studioproduktionen meistens einen unbefriedigenden Eindruck. Unsere Bemühungen sollten also in erster Hand darauf gerichtet sein, den engagierten Musikern einen Raum anzubieten, der -- auch ohne Aufnahme -- für die betreffende Musik ideal wäre, also ein Studio, das kein Studio, sondern ein idealer Musizierraum ist, ein Raum, der inspiriert. Die Technik versucht dann, davon soviel wie möglich zu erfassen.

Im Grunde genommen hat die Technik, wenn die Musikinformation einmal auf konventionellem Band oder in Zukunft digital gespeichert ist, wenige realistische Möglichkeiten für eine tatsächliche, der Interpretation dienliche Klangverbesserung. Ich denke dabei an die Aufarbeitung alter historischer Platten. Auch kann sie aus zum Beispiel einer kleinen Streichergruppe keine wirklich überzeugende grössere "zaubern," wohl aber eine manipulierte elektronische Bearbeitung liefern. Ich meine,dass die musikalische Substanz einer Interpretation durch technische Hilfsmittel nicht erzeugt, wohl aber und nur bei grober Misshandlung seitens der Technik zerstört werden kann. Das, was für den musikalischen Verbraucher wichtig ist, was ihn erfreut und ergreift, entsteht durch den Künstler im Aufnahmeraum und nur sehr selten in der technischen Apparatur. Die musikalische Diktion und Artikulation, der Komplex der Intonation, die verschiedenen Möglichkeiten der Tonerzeugung, das Vibrato und andere -- für mich aber schwer definierbare Eigenschaften sind, wie ich glaube, entscheidend für die musikalische Substanz einer Interpretation.

Natürlich ist eine geglückte Tonaufnahme immer das Resultat einer totalen Zusammenarbeit zwischen Künstler, Produzent und Techniken. Dass bei Mehrkanalaufzeichnungen und damit verbundenen anschliessenden Abmischungen -- wo, allerdings in Grenzen, wieder Raum für Interpretation vorhanden ist -- auch der ausführende Musiker oder Dirigent wieder mitdenken oder beteiligt werden sollte, ist eine Selbstverständlichkeit. Die Grenze von Eingriffen liegt für mich dort, wo Klangfarben, Klangbalance, in gewisser Hinsicht die Deutlichkeit, oder die Tonhöhe auf eine Art verändert werden, dass der musikalische Verlauf und Inhalt leider oder zerstört werden, oder der technische Eingriff die Aufmerksamkeit des Hörers auf sich zieht und vom eigentlichen Hören ablenkt.

Mir ist bewusst, dass die Wirklichkeit oft ganz anders aussieht, oft bedingt durch die Verschiedenartigkeit der Medien. Eine Rundfunkaufnahme wird oft nur ein paar Male gesendet, deshalb muss sich der Zeit -- und Kostenaufwand in engeren Grenzen bewegen. Bei Schallplattenaufnahmen können die Bedingungen günstiger sein. Eine Schallplatte/Kassette soll ja auch verkauft werden und wiederholtem Hören standhalten können. Bei Musikaufnahmen für den Film ist es

besonders erfreulich, wenn die Zusammenarbeit mit einem Regisseur geschieht, für den auch die künstlerische Durchführung einer Musikaufnahme wichtig ist. Ich denke an die Ingmar Bergman -- Produktion von Mozarts "Zauberflöte": Der Regisseur war während der gesamten Musikaufnahme anwesend und konnte unmittelbar seinen Ideen Ausdruck verleihen. Die musikalischen Forderungen waren dabei in den meisten Fällen auch fördernd für den dramatischen, bildlichen Verlauf seiner Vorstellungen, und umgekehrt befruchtete die konkrete Vorstellung eines Bildes die Musikaufnahme. Ein aufschlussreiches Detail: Ingmar Bergman wählte für die Rolle der Königin der Nacht eine "Sänger-Schauspielerin," die einige -- von Mozart komponierte -- Spitzentöne nicht singen konnte. I. B.'s Wahl der Person war wirklich begründet. Deshalb verwendeten wir die uns zur Verfügung stehenden technischen Möglichkeiten "liehen" von einer zweiten Person die fehlenden Töne, und "pflanzten" sie unserer idealen Darstellerin ein. Das war für mich allerdings doch sehr nahe an der Grenze des Erlaubten. Bei Opernfilmaufnahmen entstehen häufig spezielle Forderungen, zum Beispiel hinsichtlich der Balance Stimme -- Orchester. Die Bildlösungen von Ingmar Bergman forderten oft extreme Intensität und Nähe der menschlichen Stimme. Wie bei solchen Arbeiten üblich, nahmen wir mehrkanalig auf und konnten später bei der endgültigen Tonabmischung einen dem Bild adäquaten Ton liefern. Wie Jedoch jetzt auch meine Erfahrungen mit der Verfilmung des Zürcher Monteverdi -- Zyklusses zeigen, ist es wesentlich, dass eine Angleichung an das Bild -- wie zum Beispiel Bewegungen und Entfernungseindruck von Stimmen und Personen -- nur mit Zurückhaltung geschehen darf. Das klangliche Ergebnis soll auch ohne das Bild eine musikalische Balance haben und das gewünschte Ausdruckserlebnis vermitteln, also selbständig bestehen und vollwertig sein.

Die genannten Medien üben durch ihre Möglichkeit, Information zu übertragen und zu verbreiten, zweifellos Einfluss auf die musikalische Interpretation aus: jedermann kann sich -- mit allen Vor und Nachteilen -- ohne grossen Aufwand unterschiedliche Interpretationen anhören. Darf ich damit zu den angekündigten Musikbeispielen kommen. Ich bitte Sie, beim Hören die technische Aufnahme -- und Wiedergabequalität zu vernachlässigen und Ihre Aufmerksamkeit nur auf die musikalische Interpretation zu richten. Zunächst ein Rezitativ aus einer Kantate von Johann Sebastian Bach.Das Rezitativ steht zwischen einer Alt -- und einer Sopranarie und hat folgenden Text: "Auch bei dem himmlischen Verlangen hält unser Leib den Geist gefangen; es legt die Welt durch ihre Tücke den Frommen Netz und Stricke. Der Geist ist willig, doch das Fleisch ist schwach: dies presst uns aus ein jammervolles Ach!" In der ersten Aufnahme wird die uns inzwischen wieder bekannte Aufführungspraxis jener Zeit, also ein Rezitativ und besonders das Kirchenrezitativ rhythmisch frei und der Sprache und dem Inhalt nach zu gestalten, ausser Acht gelassen. Die gedruckten Notenwerte werden hier voll und fast stur ausgesungen und gespielt, der Inhalt jedoch wird vernachlässigt (auf dieser Schallplatte aus dem Jahre 1970!). Anschliessend folgt dasselbe Rezitativ in einer mich überzeugenden Interpretation:

BEISPIEL 1 (BWV 70,4)

Ich glaube, dass dieses Beispiel für den aufmerksamen Hörer und lernenden Musiker und Interpreten eine Menge an Information in sich birgt. Darf ich noch ein zweites Beispiel aus derselben Kantate bringen: Eine der Arien beginnt mit den Worten: "Hebt euer Haupt empor und seid getrost, ihr Frommen. . .," also ein freudiger Text und Inhalt:

BEISPIEL 2 (BWV 70,8)

Sie haben bemerkt, dass u.a. die Vorspiele zu der Arie sehr verschieden gespielt wurden.

Dass das Vorspiel als Gavotte gehört werden kann und für mich so gehört werder muss, um dem freudigen Inhalt der Arie gerecht werden zu können, wurde in der zweiten Interpretation erkannt. Als letztes Beispiel möchte ich Ihnen den bekannten langsamen Satz bzw. einen Auschnitt aus Vivaldis "Winter" vorspielen: Laut Textvorlage soll der Satz schildern, wie der Mensch, glücklich und zufrieden, von seinem Haus geschützt und vom Feuer erwärmt, die winterlichen Regengüsse übersteht. Für die Musiker der ersteren Interpretation war es eindeutig, dass Vivaldi hier offenbar den Blick von draussen, direkt aus dem niederprasselndem Regen wählte und der Hörer gleichsam durchs Fenster in das erleuchtete Zimmer hineinschaut. "Diese sehr plastische Perspektive wird durch die Instrumentation und Dynamik hervorgerufen: das Cello (molto forte) am vordergründig-lautesten stellt den Platzregen dar, die relativ lauten Pizzicati der hohen Streicher das vom Dachrand herabplätschernde Wasser -- dadurch nahezu überdeckt aber doch hörbar die liebliche Melodie des am Feuer sitzenden Menschen, begleitet von Viola (pianissimo), Orgel und Bass (piano). Das eigentliche Bild wird also durch einen dicken Schleier vordergründigen Geschehens nahezu verdeckt und in die Tiefe des Raumes gerückt; eine kühne Idee" (Zitat aus Schallplattenheft, TELEFUNKEN):

BEISPIEL 3 (Vivaldi: op. 8 Der Winter, 2. Satz)

Die zweite Interpretation unterschied sich, trotz gleicher Textvorlage, erheblich von der ersten, war aber für mich glatt und unverbindlich.

Ich möchte mit diesen Beispielen natürlich nicht sagen, dass es jeweils nur eine gültige Interpretation eines Werkes gibt. Aufregend ist ja gerade die Vielzahl der Möglichkeiten. Eine Interpretation sollte sich aber auf eine auf Wissen gründende Phantasie stützen. Da liegt eine wichtige Aufgabe für Notenverlage und Herausgeber: nämlich dem Musiker so direkt wie möglich die Partitur oder die Niederschrift des Komponisten zu vermitteln, möglichst also in Form von erstklassigen Drucken des Originals, so weit vorhanden. Dadurch werden den Musikern Umwege über Bearbeitungen erspart. Als ich vor ein paar Wochen Mozarts Klavierquartette aufnahm, standen mir fünf, aber voneinander abweichende Ausgaben zur Verfügung. Sie unterschieden sich hinsichtlich der Artikulation, Phrasierung und Dynamik, besser und aufschlussreicher wäre zweifellos ein guter Druck des Originals gewesen.

Ich habe die Auffassung, dass nur Aufnahmen, die unter den skizzierten Voraussetzungen entstanden sind oder bei denen zumindest ähnliche Kriterien angestrebt wurden, wert sind konserviert zu werden. Nur dann sind unsere Produkte für den heutigen Hörer sinnvoll und vielleicht auch für kommende Generationen. Und nur dann sind unsere Arbeiten sinnvoll als Objekt musikwissenschaftlicher Forschung, obwohl ich bei einer Aufnahme nicht die Musikwissenschaft als möglichen Verbraucher vor Augen habe.

THE MUSIC RECORDING IN MUSICOLOGICAL RESEARCH -- A DISCUSSION OF ITS VALUE AS SOURCE MATERIAL (ASPECTS CRITICAL TO SOURCES).

I believe that an involvement with the question of the value of the music recording as source material is important and, in my function as music producer and program director, perhaps can contribute to a clarification of this inquiry by first stating what is important for me in a recording, that is to say, which requirements should be fulfilled. Then with the help of a few brief musical examples, I will direct my attention to how differently one and the same composition may be interpreted, and thereby demonstrate the informational value of a recording.

I cannot treat objectively the question of which criteria should be met by a recording; I can only offer a personal point of view. In doing so, I will limit myself to the recording of so-called "classical music." The production of electronic music, jazz, pop, and conversation has, in part, different criteria and modus operandi, thus the answer to several important questions would be different in these areas, for example the question of the influence of technology upon musical interpretation, or the question of boundaries of technological intervention.

When recording I try hard not to allow the technical apparatus to become important. With all its possibilities, it should "be there" at an extremely high level: that is, be able to store the given musical information as faithfully as possible, beyond the sum of its parts; it should be able to offer perfection of cutting, the possibility of playback, and of transfer to disc or to film with the same virtuosity and precision accomplished by the musician in the recording room. I use the word "recording room" because for me the term "studio" invariably is associated with compromises and shortcomings: specifically, I do not believe that rooms exist which really are appropriate for the performance of all styles of music. When possible I try to find, for a qualified recording, rooms in which the musicians feel at home with the music they are performing. In my experience the requirements of technology most often coincide with those of the musicians; in other words, it seldom happens that an optimal location for the musicians is unsuitable for the recording. The acoustics of the performance hall plays an essential role. To briefly quote Nikolaus Harnoncourt, "Tradition has it that many composers built in, so to speak, the acoustics of the room, the reverberation, the resonance of certain sounds into their works, and many 17th and 18th Century scores -- in fact Gothic and Renaissance works as well -- will be completely misunderstood if this point is not taken into consideration." The character and length of reverberation and the resonance potential of sounds frequently are criteria for the choice of tempo and of the musical instrument (a violinist selects, on purely musical grounds, a quite particular instrument for the hall and for the composition; given the opportunity, the pianist also chooses an appropriate instrument.) How can a musician play in an inspired way in a studio when the sound first has to be manipulated by technical means from the control room or sound booth? That the result then satisfies us perhaps has to do with years of listening experience and the skill of the music director or sound engineer, and also the technical insight of the artist; but surely it has to do with coincidence and a bit of luck as well. For the most part, such studio productions are unsatisfying to me. Therefore our efforts should be directed primarily toward offering the hired musicians a room that would be ideal for the music in question -- even without recording it -- that is, a studio that is not a studio, but rather an ideal place to make music, a place that inspires. Technology then tries to do as much with that situation as possible.

Whether musical information ultimately is stored on conventional tape or, in the future, digitally, technology basically has little realistic potential for any actual improvement of sound beneficial to interpretation. In this case I am thinking of the refurbishing of early historical recordings. Neither can it, for example, "magically" turn a small string group into a really convincing larger one, although it can produce an electronically manipulated restoration. I am of the opinion that the musical substance of an interpretation may not be generated by technical means, but indeed, and only through gross maltreatment at the hands of technology, may be destroyed. That which is important to the musical consumer, that which gladdens and moves him, comes from the artist at the recording site, and very seldom from the technical apparatus. Musical diction

and articulation, the intonation complex, the different possibilities of tone production, vibrato, and other characteristics -- difficult for me to define, however -- are, I believe, critical to the musical substance of an interpretation.

Naturally, a successful recording always is the result of total collaboration between artist, producer, and technician. It is obvious that the performing musician or conductor also should participate in whatever mixing is associated with multi-track recordings, where, within limits of course, opportunity for interpretation also exists. For me, the boundaries of modification occur when timbre, tonal balance and in a certain respect, the clarity or the pitch become changed in such a way that the course of the music and its content suffer or are destroyed, or the technical modification diverts the attention of the listener onto itself and away from what actually is heard.

I am aware that the reality often is quite another matter, usually determined by differences between the media. Frequently a broadcast recording will be used only a few times, thus the time and cost outlay is more narrowly restricted. Recording on disc can be more favorable. A disc/cassette is to be sold, after all, and should be able to withstand repeated hearings.

Recording music for film is a particularly happy circumstance when collaborating with a director for whom the artistic execution of a recording also is important. I have in mind the Ingmar Bergman production of Mozart's "Magic Flute": the director was present for the entire recording of the music and could express his ideas directly. In most cases the musical requirements supported his concepts of dramatic and scenic progression, and on the other hand the concrete playing of a scene aided in the recording of the music. A significant detail: Ingmar Bergman chose for the role of Queen of the Night a "singer-actress" who could not sing some of the high notes composed by Mozart. I. B.'s choice for the role was well-founded. So we used the technical means at our disposal, "borrowed" the missing notes from a second person, and "implanted" them among those of our ideal actress. For me, however, that indeed was very near the limits of the permissible. In recordings of opera films, special problems often emerge, for example relating to the balance between voice and orchestra. Ingmar Bergman's fades away from scene often demanded extreme intensity and proximity of the human voice. As is customary on such jobs, we recorded several tracks and later, with the final mix, were able to come up with sound that was adequate to the scene's requirements. However, as my experiences with the filming of the Zürich Monteverdi cycle now show as well, it is essential that a resemblance to the picture -- for example movement and the impression of distance of voices and people -- may only be done with reservation. The tonal result should have musical balance even without the picture, and should convey the desired expressive experience, thus be independent and of high quality.

The above-named media doubtlessly exert influence on musical interpretation by means of their capability of recording and disseminating information: without great cost, anyone can hear differing interpretations -- with all the advantages and disadvantages. Allow me herewith to turn to the musical examples mentioned above. May I ask you to listen without paying heed to the technical quality of recording or playback, directing your attention only to the musical interpretation. First, a recitative from a cantata by Johann Sebastian Bach. The recitative stands between an alto and a soprano aria and has the following text:

> Auch bei dem himmlischen Verlangen hält unser Leib den Geist gefangen;
> es legt die Welt durch ihre Tücke den Frommen Netz und Stricke.
> Der Geist ist willig, doch das Fleisch ist schwach:
> dies presst uns aus ein jammervolles Ach!

In the first recording, the performance practice of that time -- having since become known to us -- has not been taken into consideration: i.e., recitative, and particularly Church recitative, is to be rhythmically free and shaped according to the language and the content. Here the printed note values are sung and played in full, almost stubbornly, but the content is neglected (on a recording from the year 1970!). Then the same recitative follows in an interpretation that is convincing to me:

EXAMPLE 1 (BWV 70, 4)

I believe that this example harbors a good deal of information for the attentive listener and the learning musician and interpreter. May I draw a second example from the same cantata: one of the arias begins with the words: "Hebt euer Haupt empor und seid getrost, ihr Frommen. . ." thus a joyful text and content:

EXAMPLE 2 (BWV 70, 8)

You will have noticed that, among other things, the preludes to the aria were played quite differently. That the prelude may be heard as a gavotte, and for me must be heard as such in order to be able to do justice to the joyous content of the aria, was recognized in the second interpretation.

As a last example I would like to play for you the well-known slow movement -- that is to say, an excerpt -- from Vivaldi's "Winter": according to the given text the movement is supposed to portray how a happy, contented man is enduring the winter downpour, sheltered by his house and warmed by the fire. In the first interpretation, it was unmistakable to the musicians that Vivaldi had chosen the view from outside, directly in the drenching rain, and that the listener likewise is peering through the window into the illuminated room. "This quite elastic perspective is evoked by the instrumentation and dynamics: the cello (molto forte) in loudest foreground represents the driving rain, the relatively loud pizzicati of high strings the water splashing down from the edge of the roof -- thus almost covered, but still audible, the quaint melody of the man sitting by the fire, accompanied by the viola (pianissimo), organ, and bass (piano). The actual picture, then, is moved back into the depths of the room, almost obscured by a thick veil of foreground events; a daring idea" (quote from the record notes, TELEFUNKEN):

EXAMPLE 3 (Vivaldi: Op. 8, Winter, 2nd movement)

In spite of the same given text, the second interpretation differs considerably from the first, but to my mind was slick and unconvincing.

In using these examples, of course I do not wish to say that there is only one valid interpretation of a work. Indeed it is the very multiplicity of possibilities that is exciting. But an interpretation should rest on imagination grounded in knowledge. Therein lies an important task for music publishers and editors: specifically, to transmit to the musician the composer's score or manuscript intact, if possible then, in the form of a first-class printing of the original -- insofar as it is available. In this way musicians would be spared detours around the arrangements. When I recorded Mozart's piano quartets a few weeks ago, I had at my disposal five editions, but each differing from the other. They differed with respect to articulation, phrasing, and dynamics; doubtlessly a good print of the original would have been better and more informative.

My view is that only recordings made under the conditions outlined, or by which at least similar criteria were attempted, are worth preserving. Only then will our products have meaning for today's listener and perhaps for coming generations as well. And only then will our works have meaning as objects of musicological research, although when recording I do not have in mind musicology as a possible consumer.

translated by Ray Giles

NEWS AND NOTES

ARSC ANNUAL CONFERENCE

The Association for Recorded Sound Collections had a successful conference in Ottawa, Canada in May. David Hall assumed his new responsibility as President of the organization. The Board voted to increase the membership dues in 1981 to $15.00. The 1981 meeting has been planned for Chapel Hill, North Carolina on April 23 - 25. Program chairperson will be Tim Brooks with Kathryn Logan as Local Arrangements chairperson.

* * * * *

ALAN LOMAX PROJECT

Alan Lomax has begun a project at the Library of Congress whereby the body of field recordings of traditional Black American music originally recorded by Alan and his father, John A. Lomax, and documented in the 1930's and 1940's, will be reevaluated and prepared for publication as an LP record series. Lomax has been assembling the choicest selections from the original field recordings with a view to issuing ten or more LP recordings of the material. The project has been made possible by a grant from the Media Arts Program of the National Endowment for the Arts.

* * * * *

LC DISC REISSUES

The Library of Congess has issued new editions of some of the first recordings released from its Archive of Folk Song: Anglo-American Ballads (AFS L1); Anglo-American Shanties, Lyric Songs, Dance Tunes, and Spirituals (AFS L2); Afro-American Spirituals, Work Songs, and Ballads (AFS L3); Afro-American Blues and Game Songs (AFS L4); and Ethnic Music of French Louisiana, the Spanish Southwest, and the Bahamas (AFS L5). Originally produced in 1942 from selected field recordings, the set was issued as 25 shellac 78 rpm discs in albums of 5 discs each. In 1956 the albums were re-issued as 5 LP recordings, direct transfers from the 78's. Although the selections on the new editions remain the same, they now have new covers and are accompanied by revised brochures, prepared by Wayne D. Shirley of the LC Music Division.

IN MEMORIAM IVÁN PETHES

On January 18, 1980, Dr. Iván Pethes, Vice-President of IASA from 1972 to 1975, died at the age of fifty-five. After having studied at the Academy of Music, Iván Pethes turned to music documentation and worked for various music libraries until he was appointed head of the documentation department of the National Management Development Centre in 1972.

1963 marked the beginning of his work in international cooperation within the framework of IAML, where he was concerned with the organization of RILM on the national level. Later on he became head of the sub-commission for classification, whose task he pursued energetically. He was vice-president of IAML from 1974-1977.

His immediate contacts with sound archives dated from the period of 1971-1973, during which he was developing an organizational and functional scheme for a Hungarian National Phonotheque. Although these plans were delayed and although Iván Pethes decided to work in a different field, this never affected his involvement with music documentation. His last years were dedicated to the preparation of a comprehensive computer-based documentary system for print and non-book material.

With his precise scientific mind and documentarist's meticulousness, Iván Pethes never failed to captivate by his friendly casualness and calm serenity. This rare combination of characteristics won him a great number of friends who feel sadly bereaved at his sudden loss.

Dietrich Schüller

PHONOGRAPHIC BULLETIN NO. 27 JULY 1980

Contents