

AES 20TH INTERNATIONAL CONFERENCE
ARCHIVING, RESTORATION, AND NEW
METHODS OF RECORDING

2001 October 5–7

Budapest, Hungary

COCHAIRS

Éva Arató-Borsi and Dietrich Schüller

HONORARY CHAIR

Gábor Heckenast

PAPERS COCHAIRS

Zoltán Vajda and Heinrich Pichler

Copyright © 2001 Audio Engineering Society, Inc.

Library of Congress Catalog Card No. 88-650002

ISBN No. 0-937803-44-8

First printing September 2001. Printed in the United States of America.

For purposes of review or as citation of authority, brief passages may be reproduced from *The Proceedings of the AES 20th International Conference* with customary credit to the source. For other purposes, reproduction of any material in *The Proceedings of the AES 20th International Conference* requires the permission of the Audio Engineering Society and the author(s). Inquiries should be sent to: Editorial Office, Audio Engineering Society, Inc., 60 East 42nd Street, New York, New York 10165-2520, USA. Telephone: (212) 661-8528, Fax: (212) 661-7829.

The Audio Engineering Society is not responsible for statements made by the contributors.

The papers published in these proceedings have been reproduced from the authors' manuscripts and without consideration by the Review Board.

Contents

COCHAIRS' GREETING	7
--------------------------	---

1

SESSION 1: CARRIER DEGRADATION9

- 1-1 **Life Expectancy Testing of Magnetic Tapes—A Key to a Successful Strategy in Audio and Video Preservation** 11
Dietrich Schüller, Phonogrammarchiv, Austrian Academy of Sciences, Vienna, Austria; and *Leopold Kranner*, ÖFI - Austrian Plastics Institute, Vienna, Austria
- 1-2 **Practical Experience with Long-Term CD-R Archiving** 15
Stanislav Psohlavec, AiP Beroun, Beroun, Czech Republic
- 1-3 **Instability and Vulnerability of CD-R Carriers to Sunlight** 18
Drago Kunej, Institute of Ethnomusicology, Scientific Research Center of the Slovenian Academy of Sciences and Arts, Ljubljana, Slovenia
- 1-4 **The Effect of Pollutants Gases on CDs**presentation without paper
Léon-Bavi Vilmont, Centre de Recherches sur la Conservation des Documents Graphiques, Paris, France

TUTORIAL27

- Toward Nanoelectronics in Data Recording**29
Arpad I. Csurgay, Budapest University of Technology, Budapest, Hungary; and *Wolfgang Porod*, University of Notre Dame, Center for Nano Science and Technology, Sound Bend, IN, USA (**Invited**)

2

SESSION 2: METADATA AND FILES39

- 2-1 **Metadata System of National Audiovisual Archive in Hungary** 41
István Szakadát, *Gábor Magyar*, and *Péter Risztics*, Budapest University of Technology and Economics, Budapest, Hungary (**Invited**)
- 2-2 **Mass Transfer, Preservation, and Metadata Requirements**presentation without paper
Kevin Bradley, National Library of Australia, Canberra, ACT, Australia
- 2-3 **Metadata—The Basis of Asset Management** 47
Siegbert Herla, Institut für Rundfunktechnik, Munich, Germany
- 2-4 **Subject and Content Description for Sound Effects in the Image and Sound Effect Database** 55
Suvi Päivikki Karhula, Tampere Polytechnic Library, Tampere, Finland
- 2-5 **Protective Nonlinear File Structure** 65
Dániel Stocker, Budapest, Hungary

- 3-1 Digital Audio Archiving in Public Broadcasting.....71**
Markku Petäjä, Jouni Frilander, Pekka Gronow, and Antti Järvinen, YLE - Finnish Broadcasting Company, Yleisradio (Helsinki), Finland (Invited)
- 3-2 Introducing Computer-Based Audio Archives in German Public Broadcast Stations—A Report about Experiences and Actual State83**
Andreas Matzke, Consultant, Berlin, Germany
- 3-3 Radio History Online.....87**
Lars Gaustad, Media Lab, National Library of Norway, Mo 1 Rana, Norway
- 3-4 New Technology for Broadcast Archive Preservation92**
Adam Lee and Richard Douglas Wright, BBC Information & Archives, Brentford, Middlesex, UK
- 3-5 Application of Speech-Rate Conversion Technology to Video Editing96**
Atsushi Imai, Nobumasa Seiyama, Takeshi Mishima, Tohru Takagi, and Eiichi Miyasaka, NHK Science and Technical Research Labs., Tokyo, Japan

- 4-1 Preservation of the BBC Radio 1 Archive.....105**
Allan Michael King, BBC, London, UK
- 4-2 High-Speed Transfer for Analog Tape to Digital Files.....115**
Harald Viering, Otari Europe GmbH, Meerbusch, Germany
- 4-3 Optimized Workstation for the Transfer of Large Collections120**
Joerg W. Houpert, Houpert Digital Audio, Bremen, Germany
- 4-4 An Integrated Solution for Digitalization, Archiving, and Restoration of Large Audio Collections129**
Christoph M. Musialik and Ulrich Hatje, Algorithmix, GmbH, Waldshut-Tiengen, Germany; and Christophe Kummer and Peter Kuhnle, NOA Audio Solutions GmbH, Vienna, Austria

- 5-1 A High Performance, Low-Cost Wax Cylinder Transcription System141**
James Bruce Nichols, Los Altos, CA, USA
- 5-2 Optical Retrieval and Storage of Analog Sound Recordings.....151**
Stefano Sergio Cavaglieri, Fonoteca Nazionale Svizzera, Lugano, Switzerland; and Ottar Johnsen and Frédéric Bapst, Ecole d'Ingenieurs de Fribourg, Fribourg, Switzerland

5-3	The Attraction of Optical Replay of Mechanical Recordings157 <i>George Brock-Nannestad</i> , Preservation Tactics, Gentofte, Denmark
5-4	The Internet Sound Restoration Service Based on the Perceptual Denoising Method162 <i>Andrzej Czyzewski</i> , Technical University of Gdansk, Gdansk, Poland

6

SESSION 6: RESTORATION, PART 2169

6-1	Reduction of Modulation Noise in Analog Full-Track Recordings Using Multitrack Replay Techniques171 <i>Franz Lechleitner</i> , <i>Berhard Berg</i> , and <i>Markus Dorfer</i> , Phonogrammarchiv, Austrian Academy of Sciences, Vienna, Austria; and <i>Heinrich Pichler</i> , Technical University, Vienna, Austria
6-2	What Are the Sources of the Noises We Remove?175 <i>George Brock-Nannestad</i> , Preservation Tactics, Gentofte, Denmark
6-3	An Interactive Pitch Defect Correction System Archival Audio183 <i>James Bruce Nichols</i> , Los Altos, CA, USA
6-4	Restoration of Nonlinearly Distorted Audio with the Application to Old Motion Pictures191 <i>Tamás B. Bakó</i> , <i>Balázs Bank</i> , and <i>Tamás Dabóczy</i> , Budapest University of Technology and Economics Dept. of Measurement and Information Systems, Budapest, Hungary
6-5	Resynchronization of Multiple Audio Sources198 <i>Christopher Hicks</i> , CEDAR Audio Ltd., Fulbourn, Cambridge, UK
6-6	Wavelet and Self-Organizing Map Declacker206 <i>Alvaro Tuzman</i> , Universidad de la República, Montevideo, Uruguay
	AUTHORS' INDEX211