Digital Audio Recording

Digital recording of oral history interviews can produce recordings of better quality and longer life than recordings made on analog tape media. Digital recording also makes it possible to provide broad access to recordings easily through various network and Internet technologies.

The quality of digital recordings depends on mastery of best practices for recording, processing, storing, and editing, as well as careful selection of equipment.

Excellent guidance and tutorials for digital audio recording are available online:

U. S. Library of Congress. Digital Formats Guide.
http://www.digitalpreservation.gov/formats/index.shtml

This Web site provides a comprehensive guide to understanding digital formats for a wide range of materials, including audio files as well as digital images and text files. See, for example, the page describing the WAVE audio format, widely considered the most suitable digital format for recording oral history interviews for long-term preservation and access: http://www.digitalpreservation.gov/formats/fdd/fdd000001.shtml .

Vermont Folklife Center http://www.vermontfolklifecenter.org/archive/res_audioequip.htm

This Web site provides the best, most up-to-date information on all aspects of digital audio recording relevant to oral history practice. The site includes equipment reviews and recommendations, advice on recording technique, and extensive links to further online and print sources of information.

Historical Voices http://www.historicalvoices.org/oralhistory/audio-tech.html

On this Web site are detailed explanations of most aspects of digital audio recording, equipment selection, and effective recording practices, as well as digitization. The site includes online tutorials with downloadable audio samples.
This Web site is produced by the staff of MATRIX, The Center for the Humane Arts, Letters, and Social Sciences Online at Michigan State University in East Lansing, Michigan. "MATRIX is devoted to the application of new technologies for teaching, research, and outreach. As one of the premier humanities computing centers in the United States, MATRIX creates and maintains online resources, provides training in computing and new teaching technologies, and creates forums for the exchange of ideas and expertise in the field.
MATRIX partners with many units at Michigan State University and with external organizations such as museums, libraries and archives that hold collections of cultural resources important for public access and humanities research, teaching and learning. MATRIX works with these partners to digitize collections, preserve digital resources and present them online for teaching and research purposes."
http://www2.matrix.msu.edu/about/

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Transom http://transom.org/

"Transom.org is an experiment in channeling new work and voices to public radio through the Internet, for discussing that work, and encouraging more."
Transom's Web site offers extensive, up-to-date information on recording equipment and techniques and audio editing tools. Although the intended audience is those who produce recordings for radio, much of the information is relevant to oral history practice, as well.

Digital Recording Equipment: Recorders

Digital recorders for oral history interviews must include the following features:

- record in uncompressed, WAV audio file format, at CD quality or better. CD quality is 16-bit, with a sampling rate of 44.1kHz;
- use readily available, high-capacity flash storage media;
- operate on both battery and plug-in power;
- provide easy USB connection for download of audio files to a computer;
- provide connection for an external microphone, preferably of the XLR professional audio type.

An excellent overview of digital audio recording and editing is available online on the Transom.org Web site: http://transom.org/tools/faqs/faq.recording_editing.html#USB

Some digital audio recorders which include the features noted above:

Marantz PMD-620

Price (approx.): $400
Recording Capability: 16-bit (44.1 kHz), 24-bit (48 kHz)
Media Card Type: SecureDigital (SD)
Sound File Format: WAV
Microphones: Two built-in condenser microphones
Inputs: Line and Microphone
Output: Phones, USB export

Edirol R-09HR

Price (approx.): $320
Recording Capability: 16-bit (44.1 kHz), 24-bit (48 kHz)
Media Card Type: SecureDigital (SD)
Sound File Format: WAV
Microphones: Two built-in condenser microphones
Inputs: Line and Microphone
Output: Phones, USB export

Olympus LS-10 Linear PCM Recorder

Price (approx.): $320
Recording Capability: 16-bit (44.1 kHz), 24-bit (48 kHz)
Media Card Type: SecureDigital (SD)
Sound File Format: WAV
Microphones: Two built-in condenser microphones
Inputs: Line and Microphone
Output: Phones, USB export

Sony Professional Portable 24-bit Linear Audio Recorder

Price (approx.): $450
Recording Capability: 16-bit (44.1 kHz), 24-bit (48 kHz)
Media Card Type: SecureDigital (SD)
Sound File Format: WAV
Microphones: Two built-in condenser microphones
Inputs: Line and Microphone
Output: Phones, USB export

Digital Recording Equipment: Microphones

Microphones appropriate for recording oral history interviews should be *condenser* type (as opposed to *dynamic* type). Condenser microphones require a power source (called *phantom* power) supplied either by the recorder device or a separate battery.

Ideally, the microphone should connect to the recorder with a balanced XLR connection, which provides the most secure and least noisy input. Field recorders often come with only a stereo mini-plug connection. Care must be taken with these connections, as they are easily dislodged. Special cables can be bought or made to convert mini-plug connections to balanced XLR connections.

For excellent overviews of microphone types and functions, see:

The Transom Tools Column: Microphones— http://transom.org/tools/faqs/faq.mics.html.

How to Buy a Microphone: A Shure Guide—
http://www.shure.com/ProAudio/Resources/BuyersGuide/us_buyers_guide_howtobuyamic

Some microphones which are appropriate for digital oral history recording are:

Audio Technica AT8033 Cardioid Condenser Microphone — http://www.audio-technica.com/cms/wired_mics/931d2ec31fd99ec2/index.html
XLR connector, battery or phantom power

Audio Technica AT8022 X/Y Stereo Microphone — http://www.audio-technica.com/cms/wired_mics/5c9c0e5adaceb659/index.html
Condenser microphone; includes two cables, one balanced (two 3-pin XLRM-type connectors at output) and one unbalanced (3.5 mm TRS at output), making it compatible with both the Marantz PMD 660 and the PMD 620.

Crown PZM-185 — http://www.crownaudio.com/mic_web/pzm.htm
Battery-powered, condenser boundary microphone with a polar pick-up pattern and an XLR connector.

Shure MX391 Microflex Boundary Microphone—
http://www.shure.com/ProAudio/Products/WiredMicrophones/us_pro_MX392_MX393_content
"Includes an attached 4 meter (12 ft) cable terminated with a 4-pin mini connector and a separate preamplifier." It is available with a variety of pick-up patterns, including the cardioid and supercardioid patterns particularly useful for oral history interviewing.

Blue Microphones Snowball — http://www.bluemic.com/products/snowball
Condenser microphone with a selectable pick-up pattern and a USB connection for direct-to-computer recording.

Sony ECM44B Electret Condenser Lavalier Microphone — http://pro.sony.com/bbsc/ssr/product-ECM44B/

AA battery operation only, with XLR Connector

Digital Audio Editing

Original digital oral history recordings should be renamed on their original media as required by a carefully designed file-naming scheme. After renaming, these original WAV files should be moved to a safe, secure digital archive location, such as a preservation server or a high-quality external hard drive. Copies of these files should be made for all other processing, including any noise reduction or other sound-enhancing work with digital sound editors, creation of transcripts or compressed files for online access, transfer to CD-R media for storage, or any other use.

For guides and reviews of software for editing digital audio, see the section 4, "Digitization," in this notebook.

Time logs, indexes, abstracts, and other search tools and finding aids are often desirable for making digital audio accessible online. These can be created with commonly available Web page tools, or specialized services and software can be used.

Randforce Associates, LLC. http://www.randforce.com/ocean/host.php?page=0

"Randforce is helping a broad range of oral history and qualitative analysis clients to digitize and index audio-video documentation. Our approach uses a unique database environment that can organize and access the audio-video content itself, not transcript or text reductions. Refining the InterClipper® software initially developed for the market research field by www.interclipper.com, Randforce helps clients work with any audio-video documentation, including oral history and other interviews, fieldwork, focus groups, meeting minutes, performance, and home video in a variety of project specific ways. Applications range from oral history collection management and access, to indexing tools for research, pedagogic, museum, library, community, and family projects."

Transcribing Digital Audio

Software is available for transcribing digital oral history recordings. Foot pedals with USB connections for computer use are also available to control playback of digital recordings.

StartStop Digital Transcription System. http://www.startstop.com/

This system includes a USB foot pedal and software to manage the playback of digital audio files and the creation of transcript documents. It works with most audio file formats and integrates seamlessly with common word processing programs such as Microsoft Word.

Express Scribe. http://www.nch.com.au/scribe/

This is open-source, freely downloadable software for playback and transcription of digital audio files. It works as a software-only system, with playback of audio controlled with assigned keystrokes. It can also be used with separately purchased USB foot pedals.

For preservation, word processing documents should be converted to a standard, widely-used text preservation format. The preservation format most commonly used for document exchange and preservation is PDF/A-1. Copies of transcripts for online access can be made in highly compressed

PDF formats. Software such as Adobe Acrobat can also be used to watermark transcript documents with copyright notices, to prevent changes to form or content, and to limit printing.

Adobe. "Creating PDF/A Documents."
http://livedocs.adobe.com/livecycle/es/sdkHelp/programmer/sdkHelp/wwhelp/wwhimpl/common/html/wwhelp.htm?context=sdkHelp&file=outputCreatingPDFA.45.1.html

Adobe Acrobat software can create PDF documents for a wide variety of applications. This Adobe Web page provides general information about the PDF/A format, its creation with Acrobat software and its use in long-term document preservation.

AIIM. PDF/A-1: ISO 19005-1:2005 FAQ. http://www.aiim.org/documents/standards/19005-1_FAQ.pdf

This Web page of frequently asked questions provides complete information on the ISO 19005-1 standard which describes and specifies the PDF/A standard as a format for long-term preservation of documents.

AIIM. PDF/A Compliant Products. http://www.aiim.org/standards/article.aspx?ID=33749

On this Web page is a list of software capable of producing PDF/A compliant documents.

U. S. Library of Congress. Digital Formats.
http://www.digitalpreservation.gov/formats/fdd/fdd000125.shtml

This Web page provides an excellent overview of the PDF/A format for long-term preservation of text documents, including both technical specifications as well as general descriptions of the format's functions and use.