

Collecting, conserving & managing sound archives

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Digital Preservation Coalition briefing 08.04.2011

Preserving Digital Sound & Vision

DEVELOPMENT OF SOUND ARCHIVES

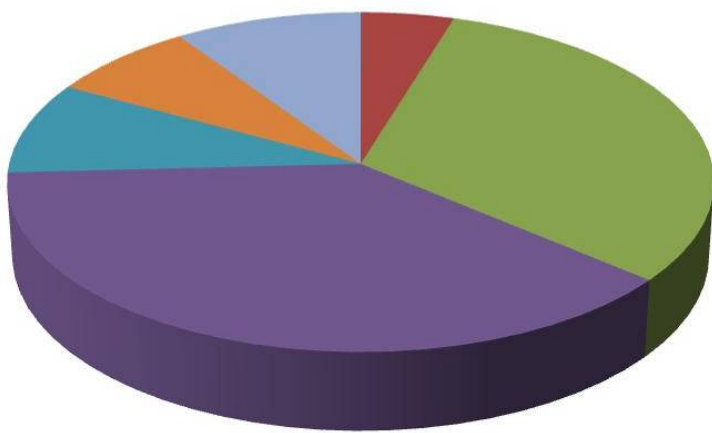
- academic field research
 - Vienna, Berlin, St Petersburg from 1890s
- domestic mechanical curios
- “public collections”
 - Rome: Discoteca di Stato
 - Paris: Phonothèque nationale
- London: EMI archives
- National libraries, national archives, media archives

THE BRITISH LIBRARY'S SOUND ARCHIVE

- Began 1948 as a general audio archive
- Part of UK's national library = The British Library
- 3.5 million recordings:
 - All formats
 - From 1857 to last week
 - >66 years of listening
 - Published, unpublished, broadcast (but no LD)



THE BRITISH LIBRARY'S SOUND ARCHIVE



- cylinders 0.03%
- shellac 5%
- vinyl 31%
- CD 38%
- other digital 9%
- audiocassette 7.5%
- 1/4" tape 9.5%



PRESERVATION - STORAGE



tapes



CD-R discs



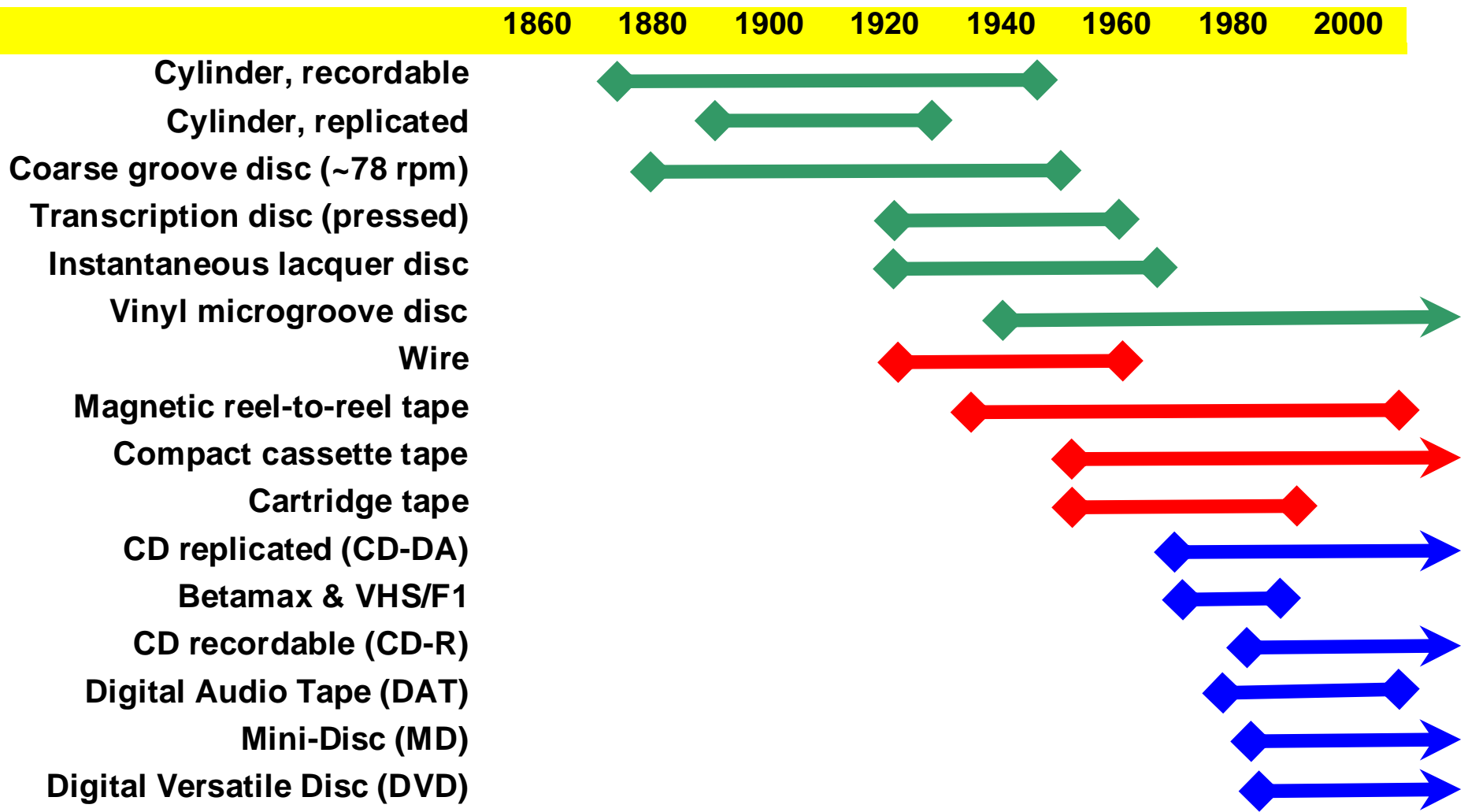
Vinyl

DELAY DECAY!

- Preservation means:
 - “the totality of things necessary to ensure the permanent accessibility – forever – of an audiovisual document with the maximum integrity”
 - permanent access



CARRIER OBSOLESCENCE



DIGITISATION: NOT AN OPTION – A NECESSITY

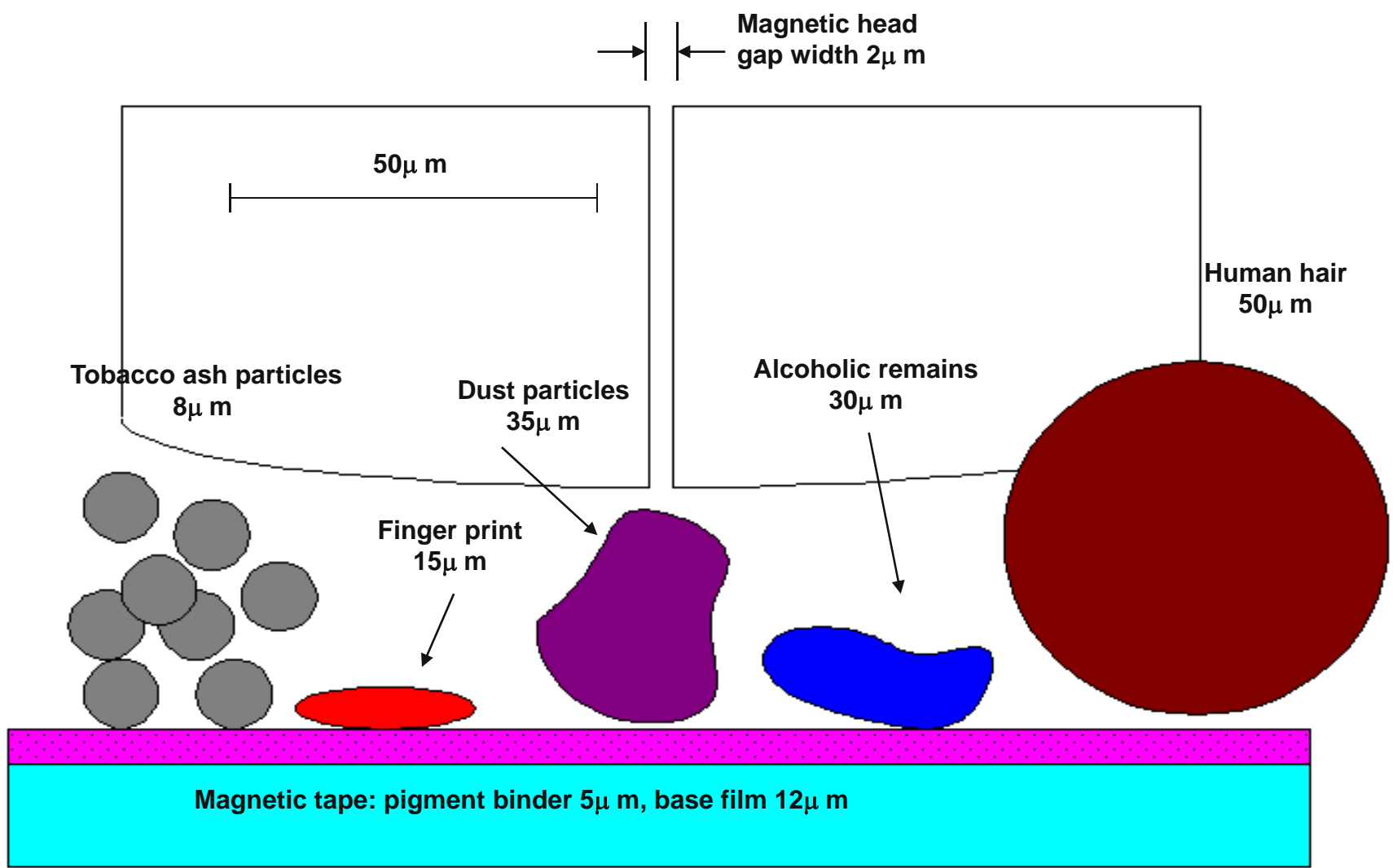
- Digitisation: not an option – a necessity
- Sound highly important culturally since 20th century
- >45 million hours audio heritage worldwide (UNESCO 1990)



DIGITISATION PRINCIPLES

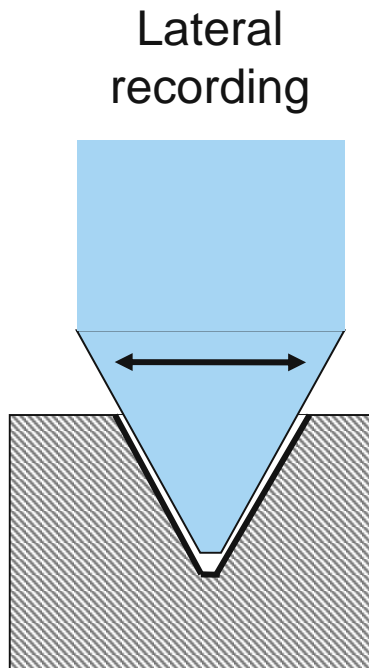
- Digitization
 - Modern playback machines and high quality ADC
 - Selection of best copy
 - Optimise carrier condition (cleaning etc)
 - Correct replay characteristics (calibration, head alignment, stylus size & shape etc)
 - A-D at 24bits/96 kHz PCM WAV format
 - *Unmodified* transfer from original
- Mass digitisation
 - x4 parallel ingest methods
 - Quadriga system
 - rendering farm
- Up to 100 hours/day digitised at BL

DIGITISATION: TAPE PLAYBACK (image A Haefner)



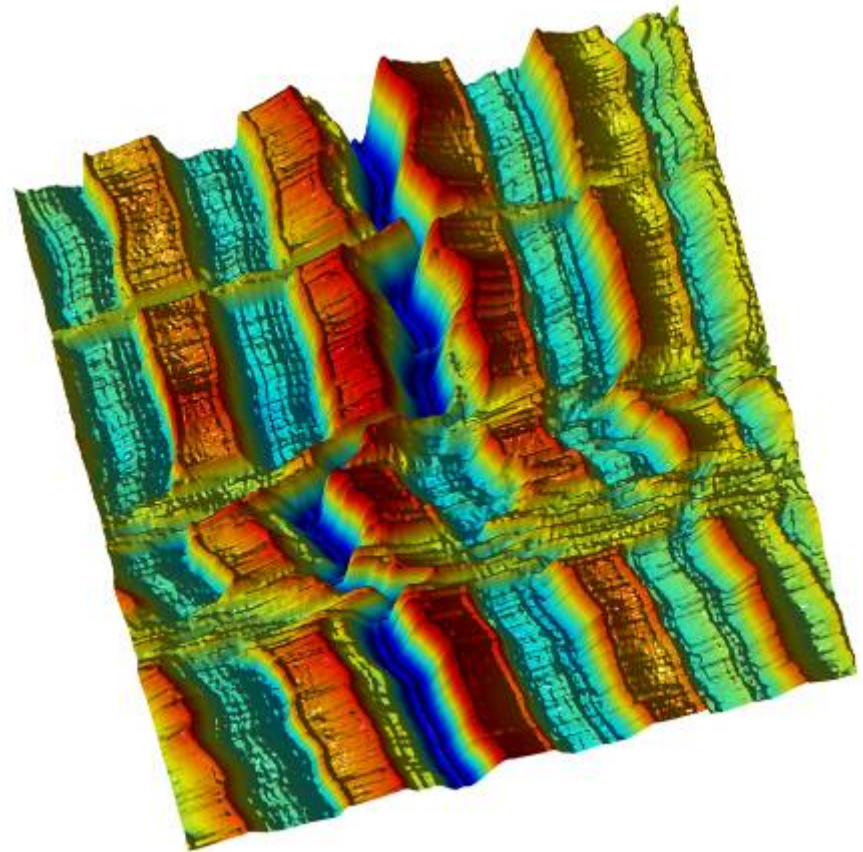
SIGNAL EXTRACTION BY IMAGING

Mechanical replay



cross section of
a disc

Optical replay

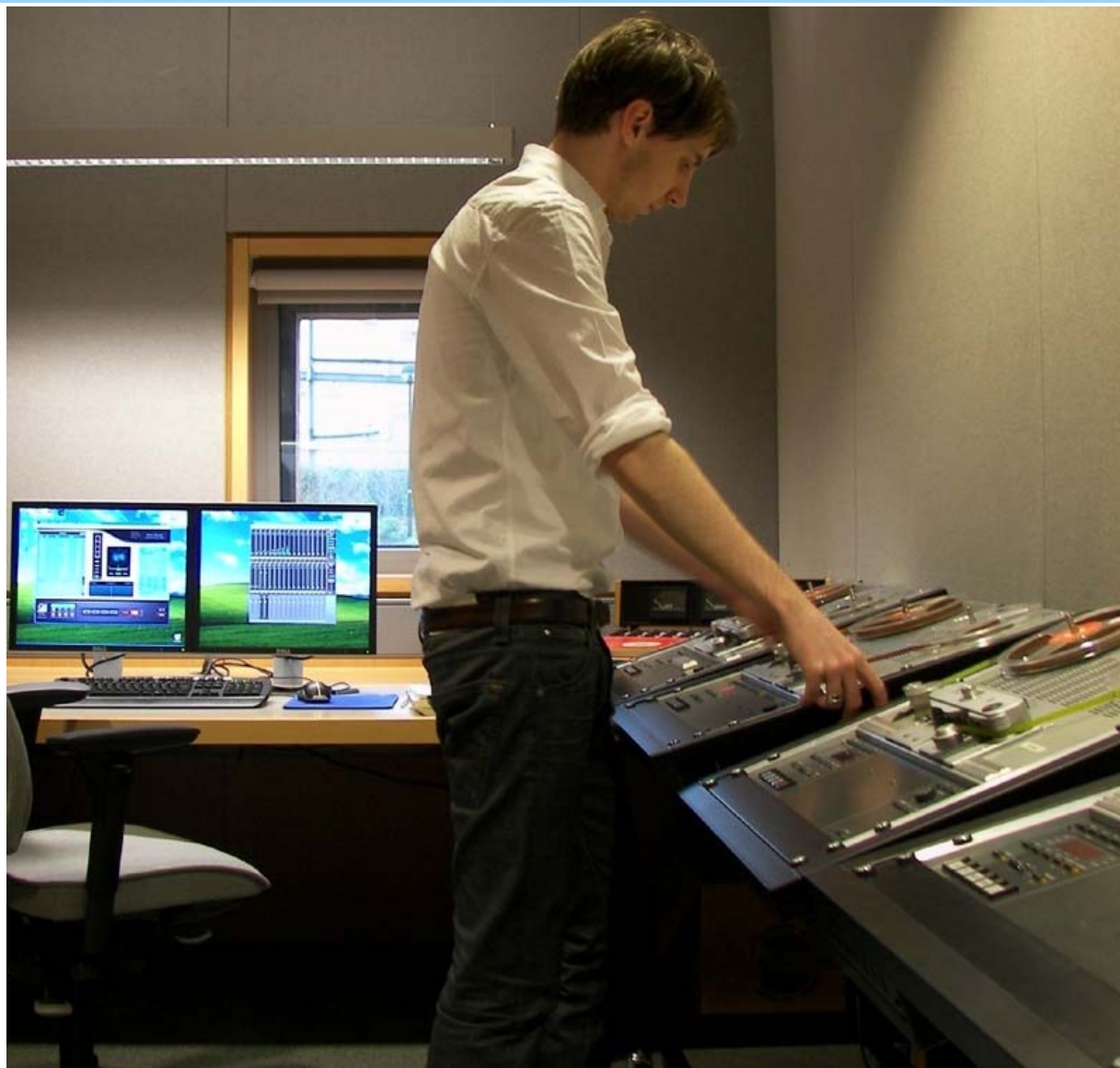


3-D surface scan of scratched area

¼ -in TAPE FORMATS

- Speeds: 15/16, 1 7/8, 3 3/4, 7 1/5, 15, 30 ips; $\pm 50\%$
- Spool Sizes: 2", 3", 4", 5", 7", 10.5", 12", 14"
- Tape thickness: LP, SP, TP
- Equalizations: NAB, CCIR
- Track Formats: Full-track mono, ½ -track, ¼ -track etc
- Noise reductions: Dolby, DBX etc

PRESERVATION & TRANSFER OF KNOWLEDGE & SKILLS, MACHINES, MANUALS



MASTER/PLAYBACK/ACCESS COPIES

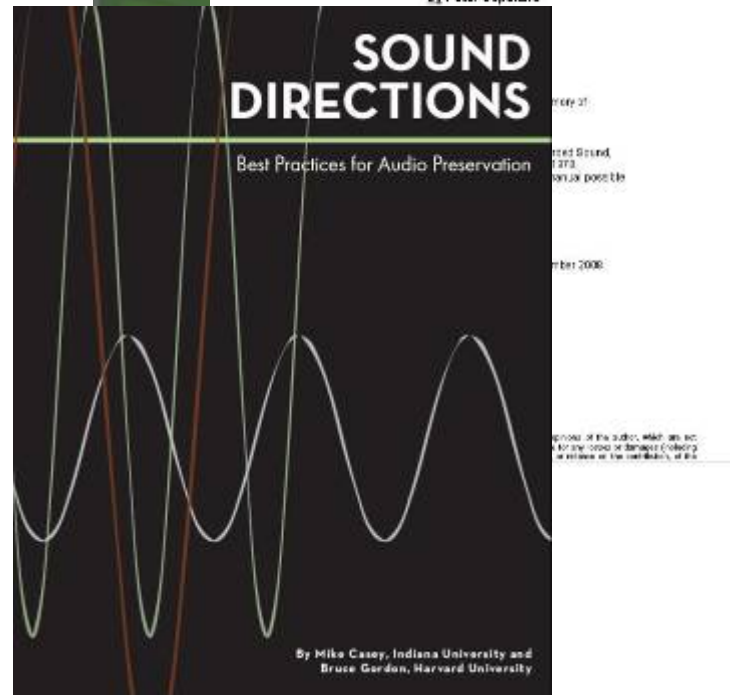
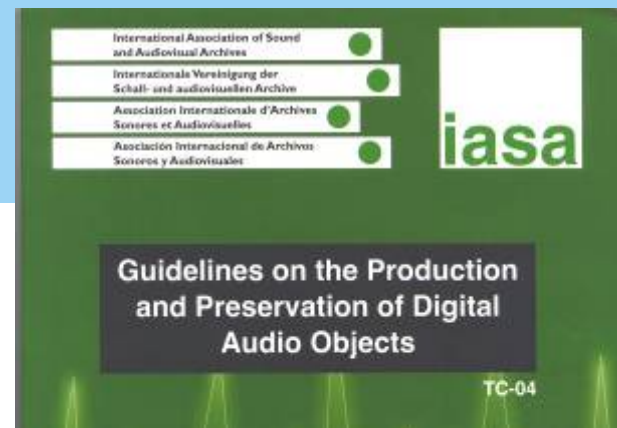
File version	Function	Data reduction	File type	Resolution	Source
Master	Archival file for permanent retention, unmodified transfer from original	Uncompressed (no data reduction)	PCM wav or BWF, mono or stereo	24-bit, 48 or 96 kHz	Original
Playback	Archival file optionally created for permanent retention, modified to increase audibility				Master file
Access	Access file not for permanent retention, optionally created for quick access and preview	Compressed	e.g. MP3, AAC, WMA	According to use, e.g. 128 or 256 kbps bitrates for web	Master or Playback file

TARGET FORMAT & CARRIER

- early digital audio archival formats: Sony F1/Betamax videotapes (used 1982-1987). CD-R, DVD-R
- 'century' platinum optical discs
- Futility of 'permanent carrier' : *preserve the content, not the carrier*
- Audio archives: early adopters of digital preservation (DMSS used by European radio archives from 1992)
- Target carrier = hard disc drives / tape storage
- BWF WAV - universally accepted (cf. video)
- If born-digital, no re-sampling or normalising
- 'Born-mp3' and other non-archival file types kept unmodified

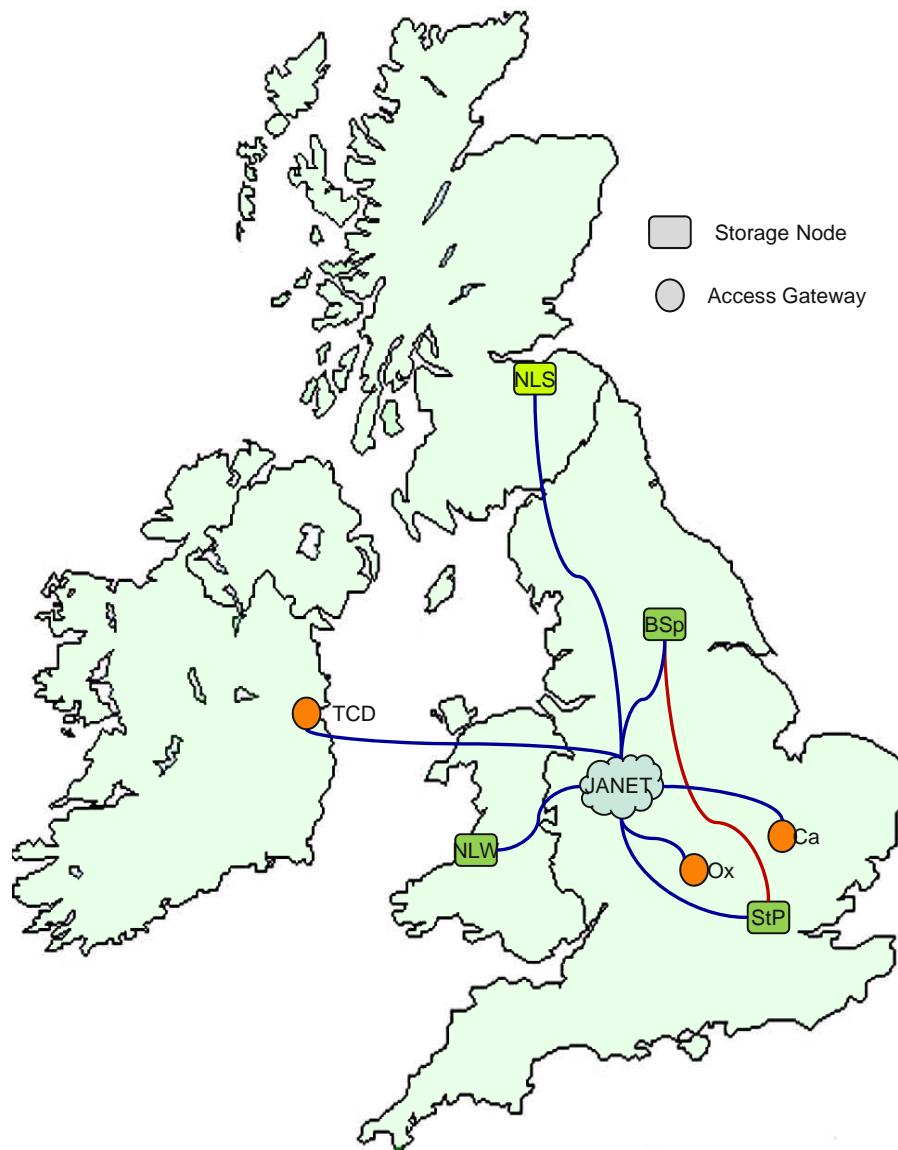
AUDIO STANDARDS

- International Association of Sound and Audiovisual Archives (IASA)
 - IASA-TC03: *The Safeguarding of the Audio Heritage: Ethics, Principles and Preservation Strategy* (2001)
 - IASA-TC04: *Guidelines on the Production and Preservation of Digital Audio Objects* (2nd ed, 2009)
- *Manual of Analogue Sound Restoration Techniques* (Peter Copeland. The British Library, 2008)
- *Sound Directions: Best Practices for Audio Preservation* (Mike Casey, Indiana University and Bruce Gordon, Harvard University, 2007)

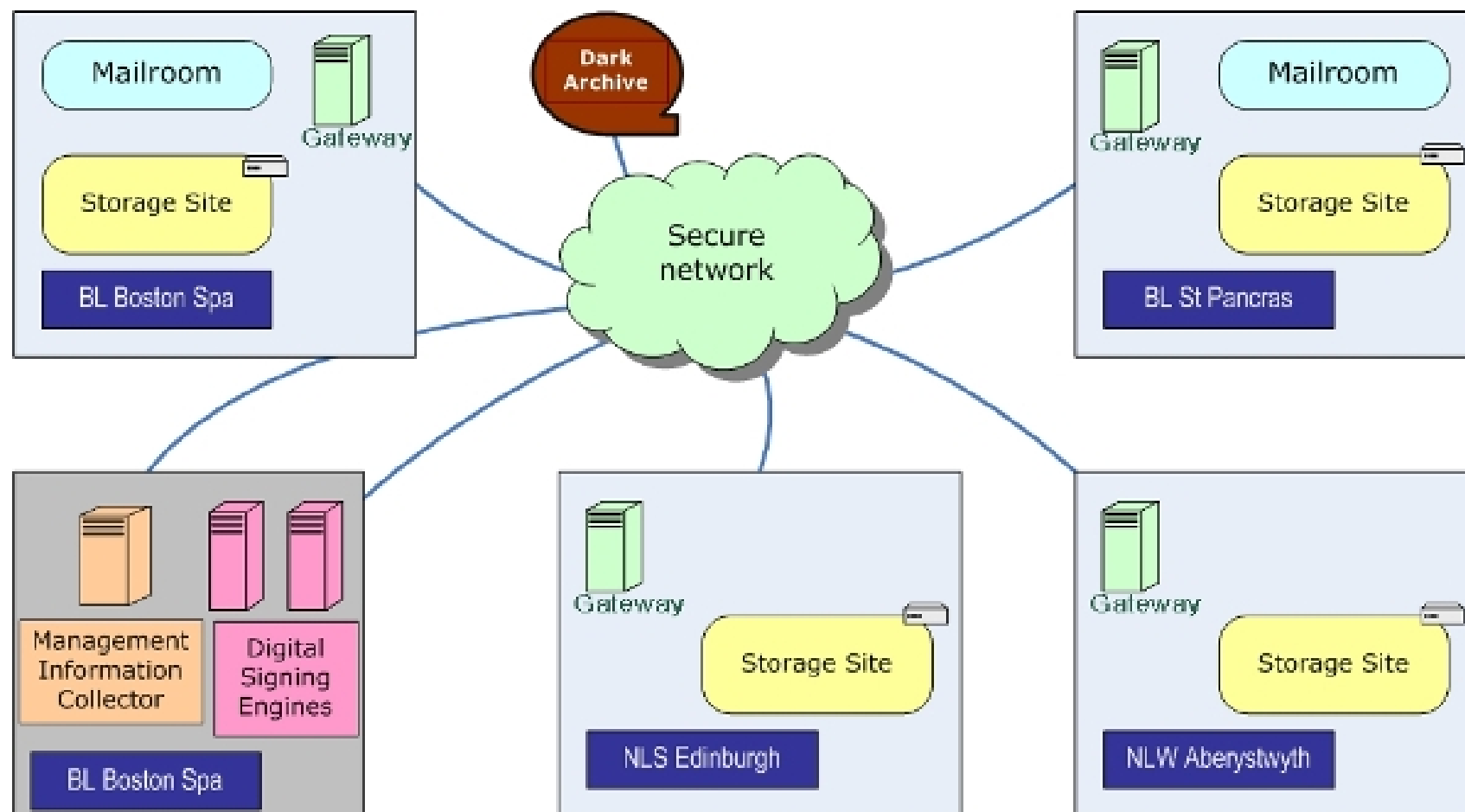


BL DIGITAL LIBRARY SYSTEM

- 1.25 million items
- 140 Tb of audio, images, texts, etc
- 4 mirrored nodes
- vendor independent
- auto replicating, checking & healing



BL DIGITAL STORE



ISSUES

- File volumes
 - 2 GB/stereo hour
 - Total British Library audio collection c. 1 PB (but x 4 in DLS)
- Time factor (cost)
 - good condition standard tapes: copying at 3x playing time
 - cylinders & lacquer discs - 15:1
 - use parallel ingest methods where possible
 - digital-digital transfers much faster than real-time
- Workflow efficiencies
 - File checking, file validation (JHOVE)
- is it legal? No preservation copying exception; IPR for access

PLANNING DIGITISATION PROJECTS: PRIORITISATION

- identify high-risk carriers - 'alert list' of vulnerability or obsolescence
- batch mixed carrier collections into carrier types and formats
- significance or value of the recording
- originals before replicas
- access rights?
- metadata quality
- carrier quantities and condition
- resources needed: staff, studio, skills, equipment

METADATA PREPARATION

SOUND ARCHIVE CATALOGUE

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record 4 of 4 for search **any words or numbers** "Bittern and norfolk"[Mark](#)[Nearby items on shelf](#)[Search for](#)[British Library website](#)**England***Botaurus stellaris* : Bittern - Ardeidae**Electronic access:** [Listen to an excerpt from this recording](#)**Species heading:** *Botaurus stellaris* : Bittern - Ardeidae**Wildlife ref. no.:** 00001**Sound category:** song**Behavioural notes:** bird not seen and it was difficult to establish how far the bird was away. It did not appear to move during the 2 hours I was on location**Visual identification:** no**Ambient temp. C:** warm**Background sounds:** marshland dawn chorus**Distance from animal:** unknown**Local time:** 0430**Recording notes:** copy or original: first generation copy**Playback mode:** 1/2**Playback speed:** 19 cms**Habitat type:** typical broadland habitat. Dense reed beds in foreground, small wood behind.**Recording date:** 1966.05.13**Country:** England**Region:** Norfolk**Locality:** Hickling Broad**Field recording equi:** tape speed 19 cms, 1/2 track, Uher 4000 L, AKG D190 microphone**Recording circumstan:** Weather conditions: good**Item copyright:** BLSA (cz,1z,nz,sz)**Recordist:** Shove, Lawrence**Item duration:** 1'21"**Sound quality code:** A**FIND FORMAT:** [W Botaurus stellaris R1](#)**Holdings****RECORDING**[Copies](#) [Material](#) [Location](#)

W BOTAURUS STELLARIS R1 C1

1 RECORDING Store

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ACCESS

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SOUND RECORDINGS**

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Sound recording history

Browse this category

You can browse within the various collections making up the category, as follows:

- [Early record catalogues](#)
- [Oral history of recorded sound](#)
- [Playback and recording equipment](#)

BROWSE all collections

- Accents and dialects
- Arts, literature and performance
- Classical music
- Environment and nature
- Jazz and popular music
- Oral history
- Sound recording history
- World and traditional music

SOUND RECORDING HISTORY

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THANKS FOR LISTENING!

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