

Why Media Preservation Can't Wait The Gathering Storm

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Website: <https://mdpi.iu.edu>

Slide design by Mike Lee



Why Media Preservation Can't Wait The Gathering Storm

- The time-based media preservation problem
 - Analog and physical digital
 - Source content for digital libraries
 - Degradation, obsolescence, and time frame



Why Media Preservation Can't Wait

The Gathering Storm

- IU as case study
 - Survey, planning project, implementation (MDPI)
 - General to specific



Why Media Preservation Can't Wait

The Gathering Storm

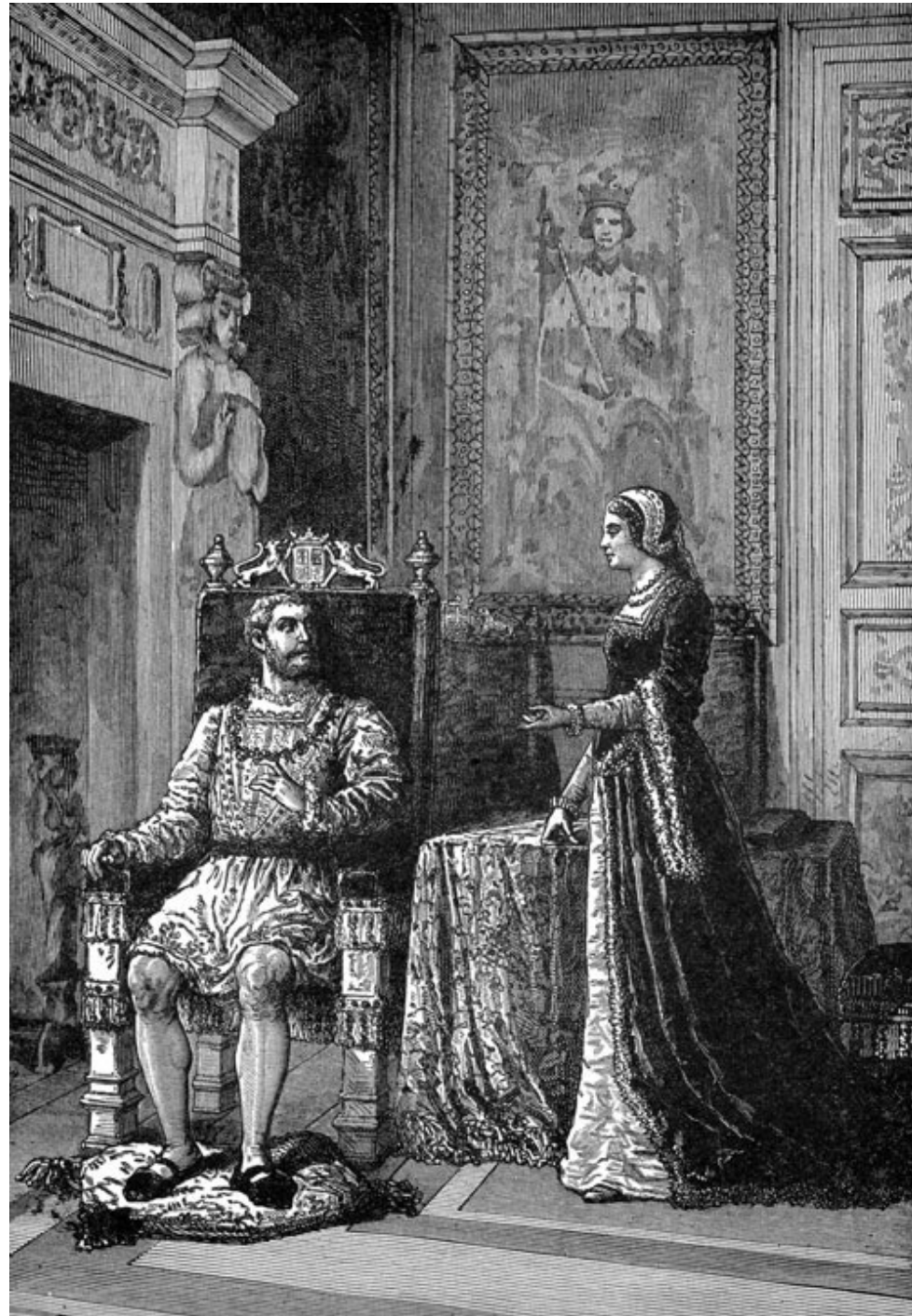
- Progress at other US institutions





Once Upon A
Time . . .

The King & Queen of Media



“...it is alarming to realize that nearly all recorded sound is in peril of disappearing or becoming inaccessible within a few generations.”

*--National Recording Preservation Board in
“Capturing Analog Sound”*



“in the mid- to long-term
there is a major risk that
carrier degradation combined
with playback obsolescence
will defeat the efforts of
archivists...”

*--International Association of Sound and
Audiovisual Archives*



“Audiovisual materials are the fastest growing segment of our nation’s archives and special collections.”

--The Library of Congress National Recording Preservation Plan, page 6



What is the problem?

- Large numbers
- Degradation
- Obsolescence
- High research value
- Short time window



Indiana Numbers

- More than 560,000 audio, video, film objects
 - 364,000 audio (64%)
 - 125,000 video (22%)
 - 78,000 film (14%)
- 80 units
- 50+ formats

Numbers

Study by AVPreserve and NEDCC

250 million audio recordings in the US are not digitized and are considered preservation-worthy

- Does not include video
- Does not include outside the US



Degradation

- All analog and physical digital media objects actively degrading
 - some catastrophically



Vinegar Syndrome *Sticky Shed Syndrome* *Fungus*
Delamination *Windowing* *Plasticizer Exudation*
Curling *Undiagnosed* *Hydrolysis* *Color Fading* *Shedding*
Scratches *Unplayability* *Efflorescence* *Crystalline Residue*
Oxidation *Shrinkage* *Mechanical Issues*
Binder Breakdown *Breaking* *Cupping*









Digital Audio Tape (DAT)

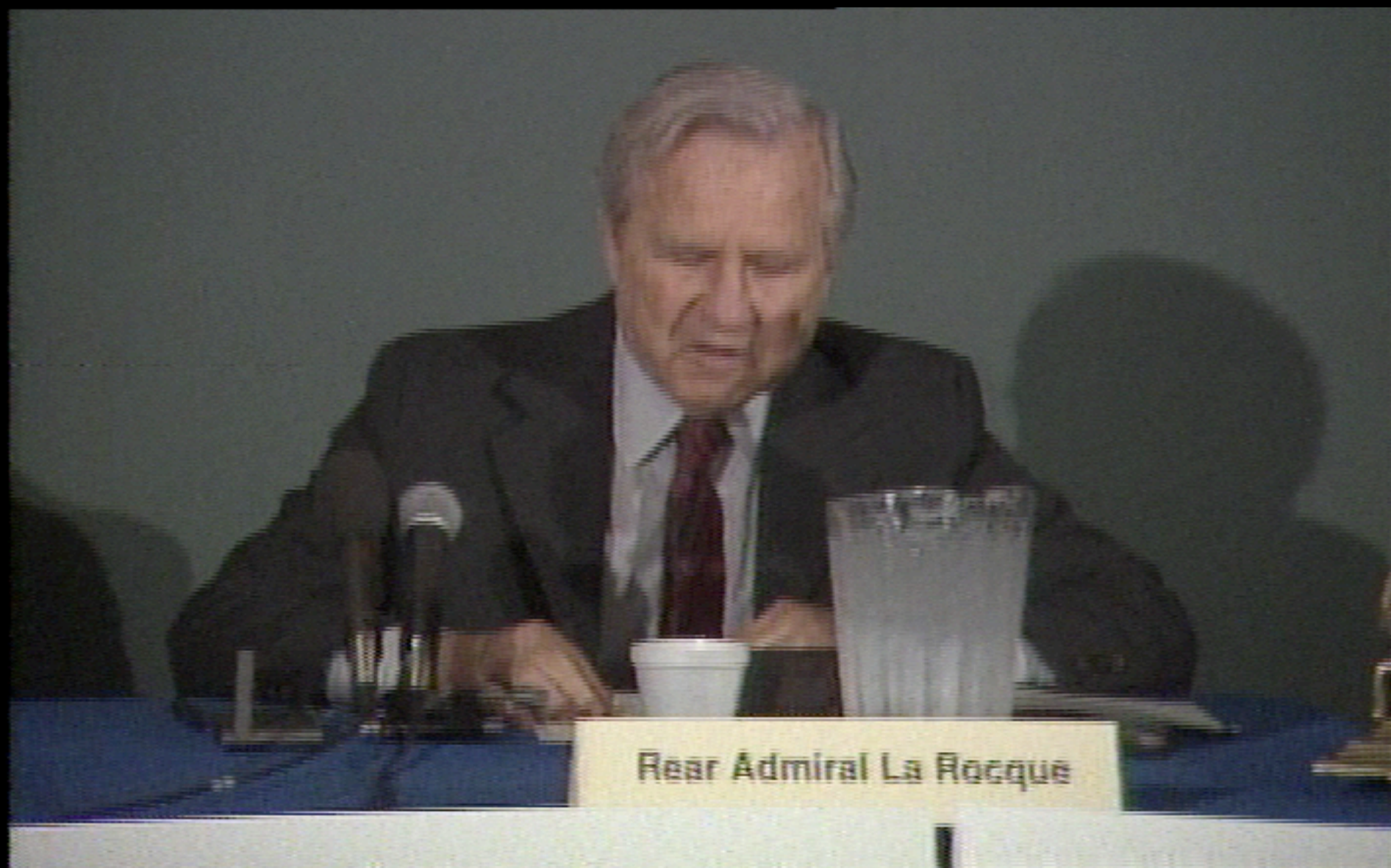
- Degradation?
- Mis-alignment of transport?
- 30% of DATs at IU Music Library







Peer Admiral's Temple





Obsolescence

- Media formats
- Equipment (playback machines, test devices)
- Repair parts
- Playback expertise
- Repair expertise
- Tools
- Supplies



33, 45, 78 (Record Time)

I'm spinning like an old turntable
Three speeds going nowhere fast
I hesitate at the door to the future
Holding on to my bitter-sweet past
Me and all of the percolators
Me and all of the rotary phones
Me and all of my vinyl records
Warped and scratched and out of date
33,45,78

Performed by Kathy Mattea
Written by Steve Key

Obsolescence

- Technics SP-15 turntable main bearing unavailable at any price
- Styli made by one small company
- Sony PCM-70x0 series DAT machine capstan motors unavailable at any price
- No new open reel audio machines
- Audio alignment tapes—one company
- Last run of playback heads for Studer tape machines—one company left

Obsolescence

- Sony ends sales of new *videotape* machines
- 1" video machines, parts, playback expertise scarce
 - Type C head assembly \$16,000
- Not enough working audio and video playback machines to digitize everything currently in vaults

The Non-Linearity of Obsolescence

- Technics SP-15 bearing made by Dave Cawley
- Revox open reel playback machine—semi-pro, 2017, target price \$4500
- 3D printing—Tascam part—partly working

Obsolescence in Action

- 12 Panasonic AG-DS840
- Free!
- 200 dried out capacitors on each machine



Obsolescence

- Quad (video) machines, parts, playback expertise very scarce
- Standard industry professional format
- Estimated 100-200 machines left worldwide
- Ampex AVR-1 (1970s) compressed air diaphragm unavailable at any cost
- Playback heads must be replaced every 3-4 months

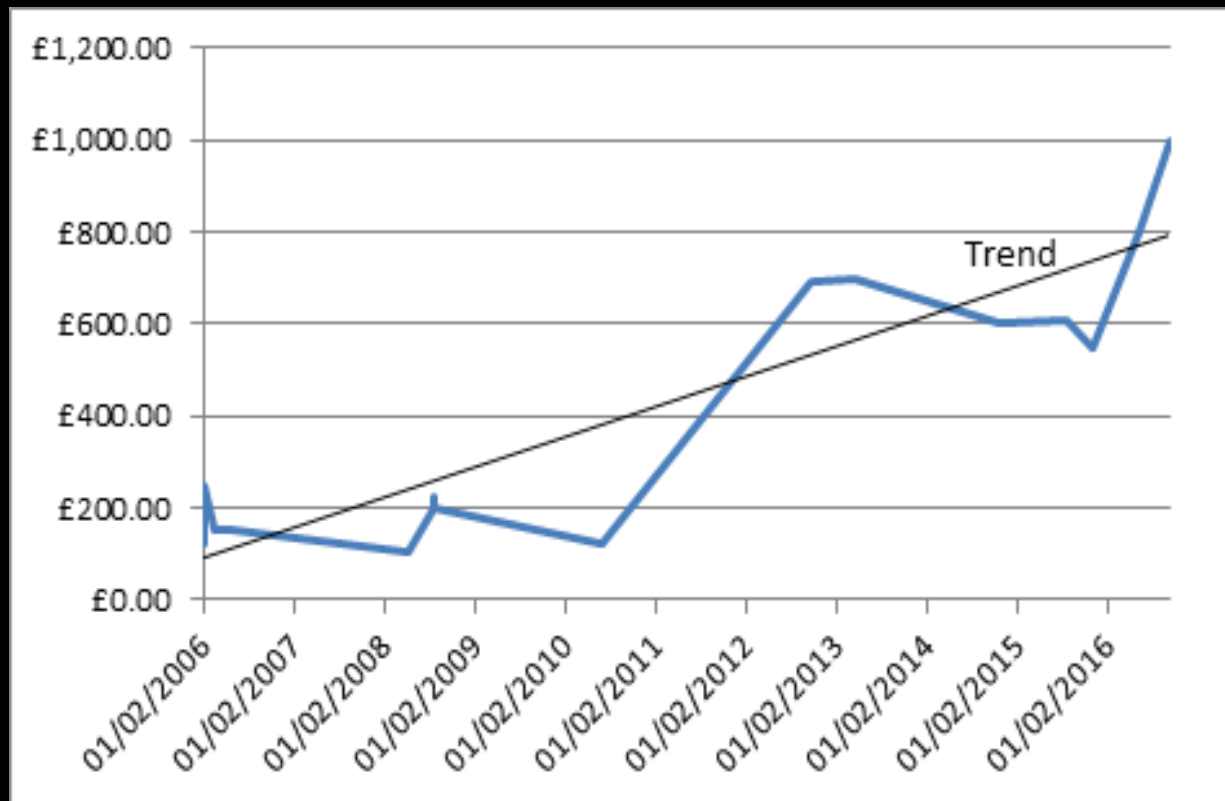
Obsolescence

- One supplier - technician is age 65
- Company appealing for money to continue refurbishing program
- Trouble getting supplies
- 2009 cost for new head= \$3500
- 2012 cost = \$5200

--information courtesy of George

Obsolescence

- Obtaining Studer open reel tape machines at the British Library



--information courtesy of Andrew

El Diablo

The slate is blank, the day is new
The past is over, future's in view
I take my strength and apply it here
Obsolescence: that was what you feared
Don't look back at what you know
It's over and this chapter has been closed

Performed by Tsunami Bomb

Written by David Alderman Ball, Richard Graham Thomas Norris, Vanessa
Quinones

Obsolescence

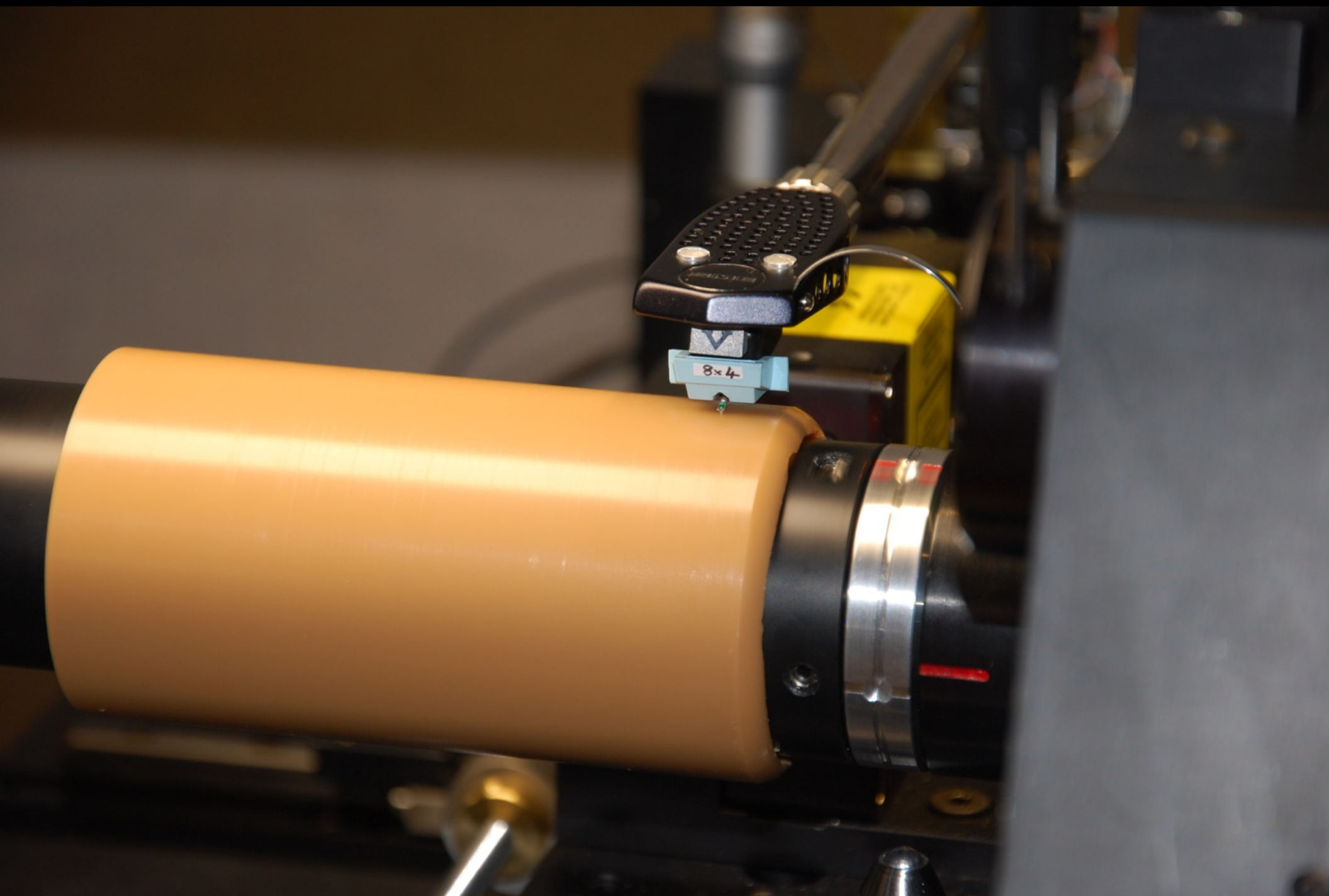
“...the old persist[s] alongside and despite the new, surviving as echoes and shadows...”

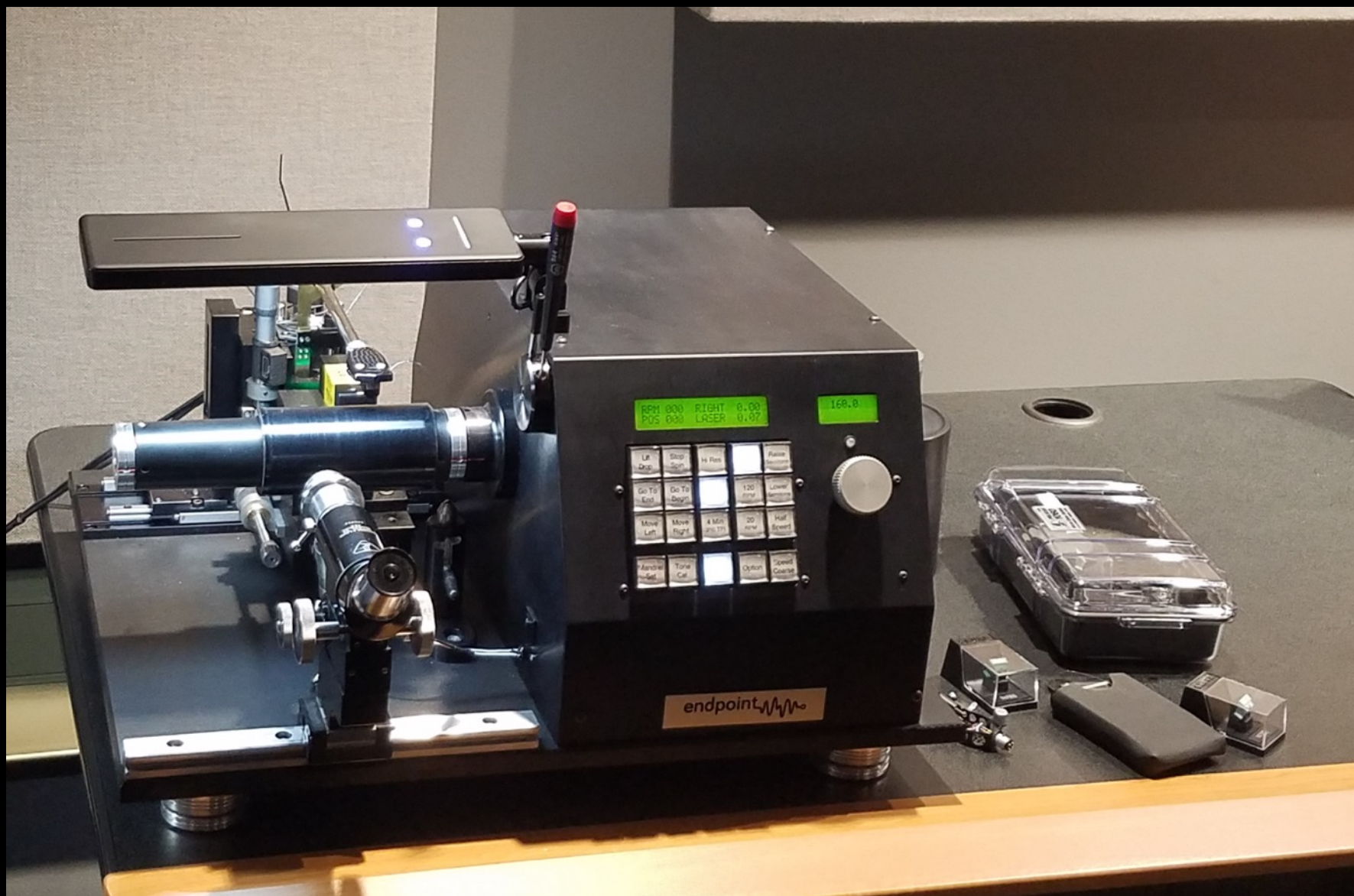
The Old Ways: A Journey on Foot
Robert Macfarlane

Obsolescence

How should we situate ourselves in relation to obsolescence?

- Progress and modernity?
- Stability and expertise?
- New and old together?





Obsolescence

How do we deal with “echoes and shadows”?

- Obsolescence budget (maintenance, repairs, “new” machines)
- Network of contacts
- Persistence
- Ingenuity and creativity

Obsolescence

All analog audio and
video formats are at
different points on a
similar obsolescence
slope

Degradation/Obsolescence

“For video the problem is even sharper:
complete disappearance of an (affordable)
ability to transfer.”

--Richard Wright, AMIA list, 2/17/2013

Degradation/Obsolescence

“75% of the analogue video held in Europe in 2006 will be lost by 2023 when video digitisation will simply have "ceased to be."”

--Richard Wright, *PrestoCentre Answers*, 2/5/2013

Degradation/Obsolescence

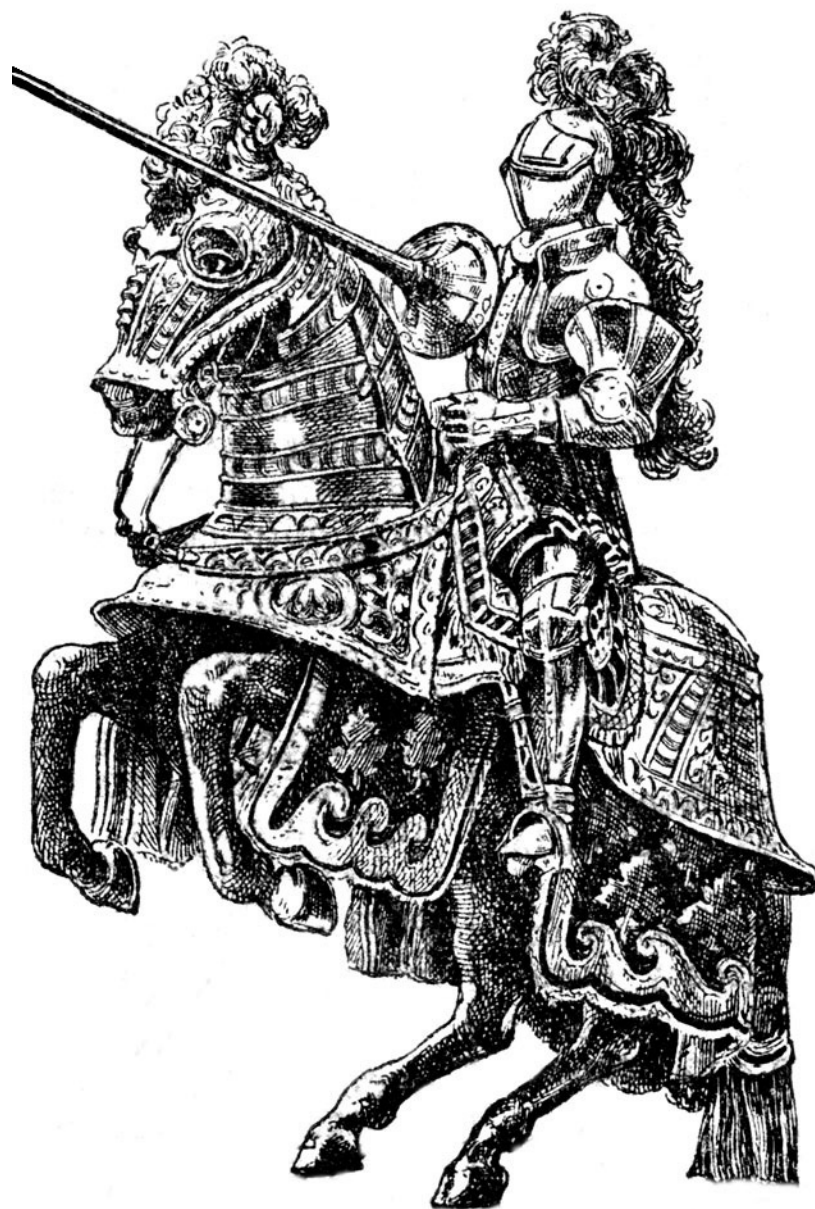
“There is a massive disaster happening here.”

-- Clifford Lynch, *Coalition for Networked Information*,
2011

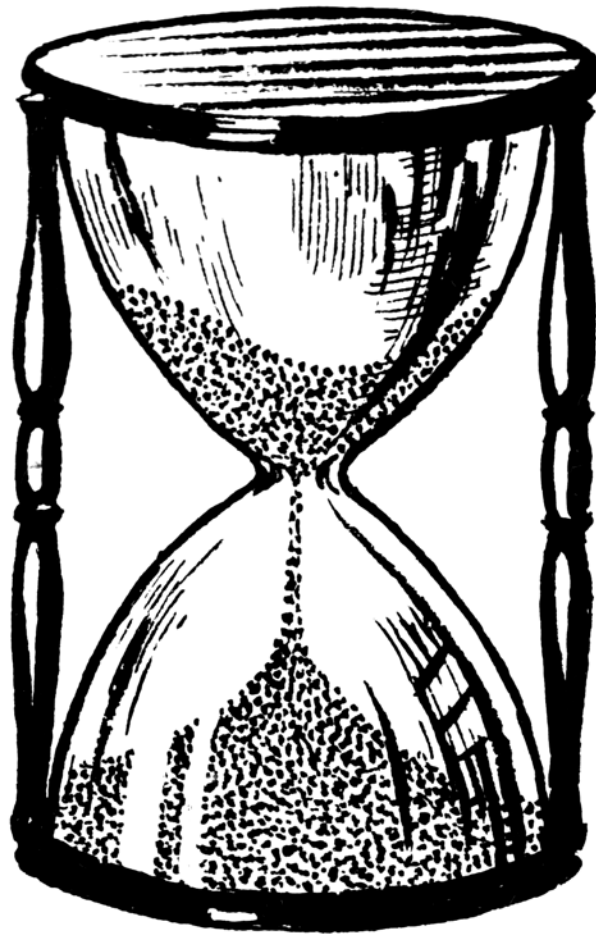
Degralescence Attacks the Kingdom of Media



Prince Codec Brandishes the Sword of Migration



The Sands of Time Slip Away



Degradation/Obsolescence

How much time do we have?

- 15-20 years



h.koppdelaney

Flickr@h.koppdelaney

Degradation/Obsolescence

“...many analog audio recordings **must be digitized within the next 15 to 20 years** – before sound carrier degradation and the challenges of acquiring and maintaining playback equipment make the success of these efforts too expensive or unattainable.”

--The Library of Congress National Recording Preservation Plan, page 7

Degradation/Obsolescence

How much time do we have?

- 15-20 years (analog audio and video)
- Less for some formats
- Degradation + Obsolescence = Impossible/Too Expensive
- Vendors and a few institutions stockpiling

The background of the slide is black, with two bright, jagged white lightning bolts striking down from the top corners, framing the central text.

Degradation/Obsolescence

How much time do we have?

10-15 Years

Degradation/Obsolescence

Audio and Video

How long will it take?

At our current pace...

Archives of Traditional Music: 58 years

Music Library: 120 years

Key Words: Massive, rapid, considered

The Battle for Media Commences



What is Indiana University Doing to Weather this Storm?



INDIANA UNIVERSITY BLOOMINGTON



Media Preservation Survey

Numbers

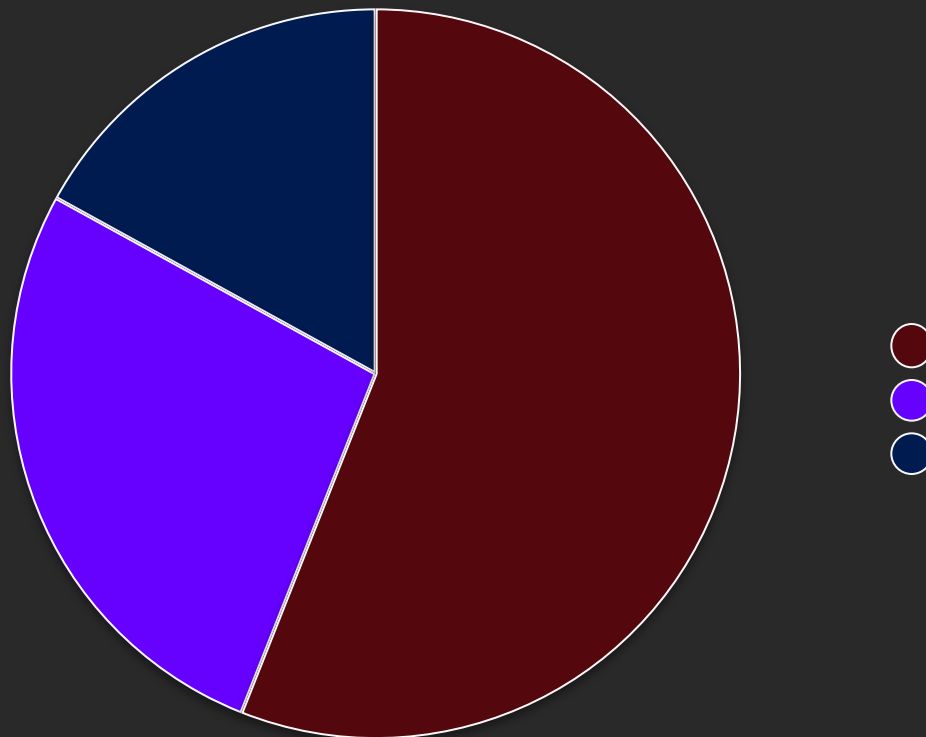
More than 560,000 audio, video, film objects

- 364,000 audio (64%)
- 125,000 video (22%)
- 78,000 film (14%)



Numbers

44% *Unique or Rare* + 56% *Commercial*
(248,000)



Lesson 1

**Highlight research and
instructional value**

(along with Degralescence)





Meeting the Challenge of Media Preservation:

Strategies and Solutions

*Indiana University Bloomington
Media Preservation Advisory Board*

Media Preservation Task Force

*Media Preservation
Working Group*

*External
Advisory Board*

*Consultant:
AudioVisual
Preservation
Solutions
(AVPS)*



Lesson 2

Preserverance

(Preservation perseverance)



2013 State of the University Announcement

Media Digitization and Preservation Initiative (MDPI)



2013 State of the University Announcement

Media Digitization and Preservation Initiative (MDPI)

Three fundamental missions of
universities:

1. The creation of knowledge (research and innovation)
2. The dissemination of knowledge (education and learning)
3. The preservation of knowledge



MDPI Overview

- Digitally preserve all significant audio and video
- Complete by IU Bicentennial in 2020
- University-wide initiative



MDPI Goal

Digitally preserve 280,000 audio
and video recordings in 3-4 years

Progress:

213,501 digitized as of Monday



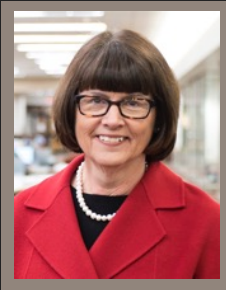
MDPI Funding

- Office of the President
- Office of the Provost
- Office of the Vice President for Research
- Additional funding and in-kind support: UITs, Libraries

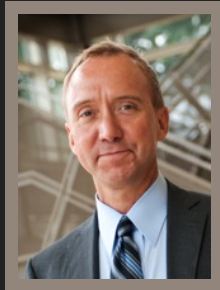


MDPI Leadership

MDPI Co-Chairs



Carolyn Walters
*Ruth Lilly Dean of
University Libraries*



Brad Wheeler
*Vice President for Information
Technology and Chief
Information Officer*

MDPI Executive Director



Dennis Cromwell
Executive Director



MDPI Personnel

Management and Coordination

- Mike Casey, MDPI Director of Technical Operations
- Brian McGough, Director, Enterprise Integration, UITS
- Julie Bobay, Executive Associate Dean, Libraries



MDPI Personnel

IU Media Digitization Studios staff

- Mike Casey
- Melissa Widzinski, Audio Engineer
- Dan Figurelli, Audio Engineer
- Rob Mobley, Video Engineer
- Adam Nickel, QC Specialist
- Glenn Hicks, QC Specialist
- Jonathan Richardson, AV Tech



MDPI Personnel

Strategic Media Access Resource Team (SMART)

- Patrick Feaster, Media Preservation Specialist
- Sherri Michaels, Head of Collection Management, IU Libraries
- 30-35 graduate students



MDPI Personnel

Software Development

- Brent Moberly
- Andrew Albrecht
- Adam Ploshay
- Will Cowan
- Sherri Michaels
- Brian Wheeler
- Patrick Feaster
- Brian McGough



MDPI Personnel

Library and IU Units Operations Team

- Julie Hardesty
- Thomas Whitaker
- Erika Dowell
- Gary Charbonneau
- Alan Burdette
- Phil Ponella
- Tony Tadey
- Jon Dunn
- 10 others previously named above



MDPI Personnel

IT Team

- Kurt Siefert
- David Hunter
- Kristi Kallback-Rose
- Danko Antolovic'
- John Wright
- Brian McGough



MDPI Personnel

IT Communications

- Keith Danielson
- Alan Mauro
- Amanda Chambliss
- Joe Stone
- Ralph Zuzolo
- Brian Hawkins
- Madeline Grdina
- Daphne Siefert-Herron



MDPI Personnel

Finance, facilities, and administrative assistance

- Misty Smith
- Doug Mayo
- Heather Pawluk
- Don Brock
- Doug Chambers
- Chris Hayden



MDPI Personnel

SIP Working Group

- Ronda Sewald
- Julie Hardesty
- Susan Hooyenga
- Brian Wheeler
- Brian McGough
- Jon Dunn



MDPI Personnel

Access Advisory Working Group

- Naz Pantaloni
- Dina Kellams
- Barbara Truesdell
- Heidi Dowding
- Nick Homenda
- Rachael Stoeltje
- 13 others previously named above



MDPI Personnel

Media-holding Unit Staff

- Numerous staff from many units



MDPI Personnel

Audio and Video Technical Working Groups

- Konrad Strauss
- Mark Hood
- Tony Tadey
- John Wright



MDPI Personnel

Consultant

- AVPreserve

Colleagues

- Michael Angeletti, Stanford University
- Chris Lacinak, AVPreserve
- Dave Rice, CUNY
- Library of Congress Packard campus
- Danny Sbardella, New York Public Library
- National Library of Norway
- NARA
- Tom de Smet, Sound & Vision
- Brecht Declercq, VIAA
- Many others...



Lesson 3

It takes a village...



MDPI Digitization Strategy

- Paradigm shift: partnership with a private company
- Sony Memnon
- Key to realizing goals around cost and timeframe without sacrificing quality



MDPI Digitization Strategy

- Memnon - parallel transfer (industrial-scale) workflows
- IU - 1:1 workflows for fragile formats and problem items
- 6.5 PB in 4 years



Lesson 4

**We don't have to do it all
ourselves**



MDPI Digitization Strategy

Project file formats

- Audio preservation master - BWF, 24/96
- Audio production master - same
- Video preservation master -
- FFV1/Matroska
- Video mezzanine - 50 Mbps MPEG-2



MDPI Digitization Facility

- Innovation Center, Tech Park, IU Bloomington campus
- Renovation December 2014 - May 2015
- 8,400 square feet (780 sq m)
- 21 rooms
- Open for non-IU business



MDPI Pre-Digitization Workflow

- Feeding the beast

At peak -

- 9 TB per day
- 320 hours digitized per day
- 616 physical objects digitized per day
- 2,700 files created per day



MDPI Pre-Digitization Workflow

SMART - led by Sherri Michaels and Patrick Feaster

- Sort by technical characteristics
- Gather technical metadata
- Barcode
- Place in batch
- Transport to facility



Lesson 5

**Prep workflow requires
more time and resources
than expected**



Bottleneck in the system





Physical Object Database

[Physical Objects](#) [Batches](#) [Bins](#) [Pick Lists](#) [Statuses](#) [Returns](#) [Quality Control](#) [Reports](#) Search [Edit](#) [Delete](#) [Split Record](#) [Create New Physical Object](#) [View Workflow History](#) [Edit Ephemera Status](#) [Digital Workflow](#)

Physical Object [114455]

Assignment	
Picklist	ATM ORT for IU side
Bin	Bin: 40000000014847
Box	Not Assigned
Batch	IU-0004-OR

MDPI barcode	<input type="text" value="40000001211863"/>
Format	<input type="text" value="Open Reel Audio Tape"/>
Has ephemera	<input type="checkbox"/>
Ephemera returned	<input type="checkbox"/>
Unit	<input type="text" value="B-ATM"/>
Title	<input type="text"/>
Call number	<input type="text" value="OT 5160"/>
IUCAT barcode	<input type="text" value="0"/>
Year	<input type="text" value="1976"/>
Group key	GR00083515
Group position	<input type="text" value="1"/>
Carrier stream index	GR00083515_1_1
Imported from spreadsheet	ATM_OPENREEL_MIXEDSPEEDS_OBJECTS_INHOUSE_Slow UnknownSpeeds.csv
Workflow Status	Binned >> Batched >> Shipped

Hidden Fields

Open Reel Audio Tape Technical Metadata

Pack deformation	<input type="text" value="Moderate"/>
Preservation problems	<input type="text"/>
Reel size	<input type="text" value="5 in."/>
Playback speed	3.75 ips, 7.5 ips

One batch



Memnon Digitization

Receiving and ingest

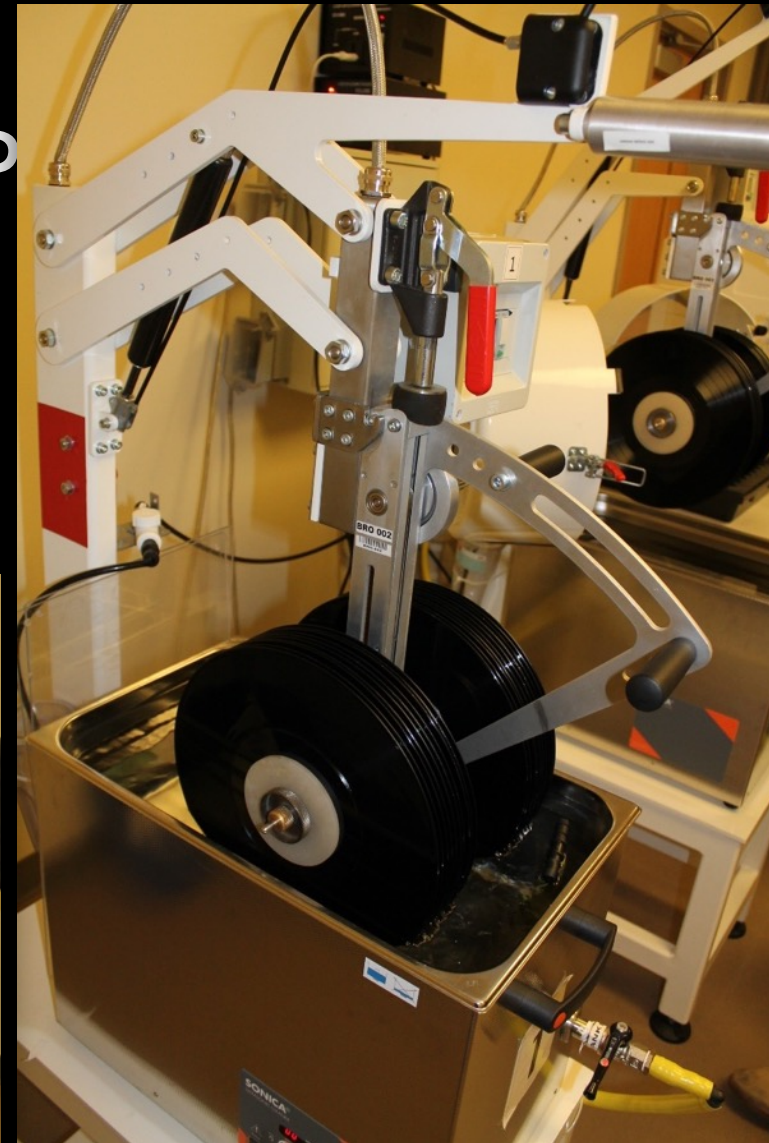


Import metadata

Batch number	Batch description	Unit	IU Object ID - Call number	Container barcode	Container name	Container description	Output file-name prefix	Year	Tape base	Reel size	Track configuration	Sound field	Playback speed	Tape thickness	Tape sto
67	M-0008-QR	7.5 ips half track stereo non-sticky shed polyester from Music Library	B-MUSIC TP-S A1828 814-17 v. 1	40000000010019	ML-OR-001	ML poly 1 (7.5 ips poly half track stereo non-sss)	MDPI_400000000088767	1981	Polyester	7 in.	Half track	Stereo	7.5 ips	15 mil	Scotch 2
75	M-0008-QR	7.5 ips half track stereo non-sticky shed polyester from Music Library	B-MUSIC TP-S A1828 814-17 v. 2	4000000000010019	ML-OR-001	ML poly 1 (7.5 ips poly half track stereo non-sss)	MDPI_400000000088775	1981	Polyester	7 in.	Half track	Stereo	7.5 ips		Scotch 2
83	M-0008-QR	7.5 ips half track stereo non-sticky shed polyester from Music Library	B-MUSIC TP-S A1828 814-17 v. 3	4000000000010019	ML-OR-001	ML poly 1 (7.5 ips poly half track stereo non-sss)	MDPI_400000000088783	1981	Polyester	7 in.	Half track	Stereo	7.5 ips		Scotch 2
91	M-0008-QR	7.5 ips half track stereo non-sticky shed polyester from Music Library	B-MUSIC TP-S A1838 65-13 v. 1	4000000000010019	ML-OR-001	ML poly 1 (7.5 ips poly half track stereo non-sss)	MDPI_400000000088791	1979	Polyester	7 in.	Half track	Stereo	7.5 ips	15 mil	Scotch 2
99	M-0008-QR	7.5 ips half track stereo non-sticky shed polyester from Music Library	B-MUSIC TP-S A1838 65-13 v. 2	4000000000010019	ML-OR-001	ML poly 1 (7.5 ips poly half track stereo non-sss)	MDPI_400000000088809	1979	Polyester	7 in.	Half track	Stereo	7.5 ips		Scotch 2
107	M-0008-QR	7.5 ips half track stereo non-sticky shed polyester from Music Library	B-MUSIC TP-S A1838 65-13 v. 3	4000000000010019	ML-OR-001	ML poly 1 (7.5 ips poly half track stereo non-sss)	MDPI_400000000088817	1979	Polyester	7 in.	Half track	Stereo	7.5 ips		Scotch 2
115	M-0008-QR	7.5 ips half track stereo non-sticky shed polyester from Music Library	B-MUSIC TP-S A1838 65-13 v. 4	4000000000010019	ML-OR-001	ML poly 1 (7.5 ips poly half track stereo non-sss)	MDPI_400000000088825	1979	Polyester	7 in.	Half track	Stereo	7.5 ips		Scotch 2
123	M-0008-QR	7.5 ips half track stereo non-sticky shed polyester from Music Library	B-MUSIC TP-S A2145 76-3-12 v. 1	4000000000010019	ML-OR-001	ML poly 1 (7.5 ips poly half track stereo non-sss)	MDPI_400000000088833	1976	Polyester	7 in.	Half track	Stereo	7.5 ips		Scotch 2
141	M-0008-QR	7.5 ips half track stereo non-sticky shed polyester from Music Library	B-MUSIC TP-S A2145 76-3-12 v. 2	4000000000010019	ML-OR-001	ML poly 1 (7.5 ips poly half track stereo non-sss)	MDPI_400000000088841	1976	Polyester	7 in.	Half track	Stereo	7.5 ips		Scotch 2
58	M-0008-QR	7.5 ips half track stereo non-sticky shed polyester from Music Library	B-MUSIC TP-S A2145 76-3-12 v. 3	4000000000010019	ML-OR-001	ML poly 1 (7.5 ips poly half track stereo non-sss)	MDPI_400000000088858	1976	Polyester	7 in.	Half track	Stereo	7.5 ips		Scotch 2
66	M-0008-QR	7.5 ips half track stereo non-sticky shed polyester from Music Library	B-MUSIC TP-S A2328 77-12-9 v. 1	4000000000010019	ML-OR-001	ML poly 1 (7.5 ips poly half track stereo non-sss)	MDPI_400000000088866	1977	Polyester	7 in.	Half track	Stereo	7.5 ips		Scotch 2
74	M-0008-QR	7.5 ips half track stereo non-sticky shed polyester from Music Library	B-MUSIC TP-S A2328 77-12-9 v. 2	4000000000010019	ML-OR-001	ML poly 1 (7.5 ips poly half track stereo non-sss)	MDPI_400000000088874	1977	Polyester	7 in.	Half track	Stereo	7.5 ips		Scotch 2
82	M-0008-QR	7.5 ips half track stereo non-sticky shed polyester from Music Library	B-MUSIC TP-S A2328 77-12-9 v. 3	4000000000010019	ML-OR-001	ML poly 1 (7.5 ips poly half track stereo non-sss)	MDPI_400000000088882	1977	Polyester	7 in.	Half track	Stereo	7.5 ips		Scotch 2
90	M-0008-QR	7.5 ips half track stereo non-sticky shed polyester from Music Library	B-MUSIC TP-S A2328 78-12 v. 1	4000000000010019	ML-OR-001	ML poly 1 (7.5 ips poly half track stereo non-sss)	MDPI_400000000088890	1978	Polyester	7 in.	Half track	Stereo	7.5 ips		Scotch 2
98	M-0008-QR	7.5 ips half track stereo non-sticky shed polyester from Music Library	B-MUSIC TP-S A2328 78-12 v. 2	4000000000010019	ML-OR-001	ML poly 1 (7.5 ips poly half track stereo non-sss)	MDPI_400000000088908	1978	Polyester	7 in.	Half track	Stereo	7.5 ips		Scotch 2
106	M-0008-QR	7.5 ips half track stereo non-sticky shed polyester from Music Library	B-MUSIC TP-S A2328 78-12 v. 3	4000000000010019	ML-OR-001	ML poly 1 (7.5 ips poly half track stereo non-sss)	MDPI_400000000088916	1978	Polyester	7 in.	Half track	Stereo	7.5 ips		Scotch 2
124	M-0008-QR	7.5 ips half track stereo non-sticky shed polyester from Music Library	B-MUSIC TP-S A2328 78-14 v. 1	4000000000010019	ML-OR-001	ML poly 1 (7.5 ips poly half track stereo non-sss)	MDPI_400000000088924	1978	Polyester	7 in.	Half track	Stereo	7.5 ips		Scotch 2
32	M-0008-QR	7.5 ips half track stereo non-sticky shed polyester from Music Library	B-MUSIC TP-S A2328 78-14 v. 2	4000000000010019	ML-OR-001	ML poly 1 (7.5 ips poly half track stereo non-sss)	MDPI_400000000088932	1978	Polyester	7 in.	Half track	Stereo	7.5 ips		Scotch 2
40	M-0008-QR	7.5 ips half track stereo non-sticky shed polyester from Music Library	B-MUSIC TP-S A2328 78-14 v. 3	4000000000010019	ML-OR-001	ML poly 1 (7.5 ips poly half track stereo non-sss)	MDPI_400000000088940	1978	Polyester	7 in.	Half track	Stereo	7.5 ips		Scotch 2
57	M-0008-QR	7.5 ips half track stereo non-sticky shed polyester from Music Library	B-MUSIC TP-S A2328 79-3-13 v. 1	4000000000010019	ML-OR-001	ML poly 1 (7.5 ips poly half track stereo non-sss)	MDPI_400000000088957	1979	Polyester	7 in.	Half track	Stereo	7.5 ips		Scotch 2
65	M-0008-QR	7.5 ips half track stereo non-sticky shed polyester from Music Library	B-MUSIC TP-S A2328 79-3-13 v. 2	4000000000010019	ML-OR-001	ML poly 1 (7.5 ips poly half track stereo non-sss)	MDPI_400000000088965	1979	Polyester	7 in.	Half track	Stereo	7.5 ips		Scotch 2
73	M-0008-QR	7.5 ips half track stereo non-sticky shed polyester from Music Library	B-MUSIC TP-S A2328 79-3-13 v. 3	4000000000010019	ML-OR-001	ML poly 1 (7.5 ips poly half track stereo non-sss)	MDPI_400000000088973	1979	Polyester	7 in.	Half track	Stereo	7.5 ips		Scotch 2
81	M-0008-QR	7.5 ips half track stereo non-sticky shed polyester from Music Library	B-MUSIC TP-S A398 814-11 v. 1	4000000000010019	ML-OR-001	ML poly 1 (7.5 ips poly half track stereo non-sss)	MDPI_400000000088981	1981	Polyester	7 in.	Half track	Stereo	7.5 ips		Scotch 2
89	M-0008-QR	7.5 ips half track stereo non-sticky shed polyester from Music Library	B-MUSIC TP-S A398 814-11 v. 2	4000000000010019	ML-OR-001	ML poly 1 (7.5 ips poly half track stereo non-sss)	MDPI_400000000088999	1981	Polyester	7 in.	Half track	Stereo	7.5 ips		Scotch 2
05	M-0008-QR	7.5 ips half track stereo non-sticky shed polyester from Music Library	B-MUSIC TP-S A5276 76-4-22 v. 1	4000000000010019	ML-OR-001	ML poly 1 (7.5 ips poly half track stereo non-sss)	MDPI_400000000089005	1976	Polyester	7 in.	Half track	Stereo	7.5 ips		Scotch 2
13	M-0008-QR	7.5 ips half track stereo non-sticky shed polyester from Music Library	B-MUSIC TP-S A5276 76-4-22 v. 2	4000000000010019	ML-OR-001	ML poly 1 (7.5 ips poly half track stereo non-sss)	MDPI_400000000089013	1976	Polyester	7 in.	Half track	Stereo	7.5 ips		Scotch 2
21	M-0008-QR	7.5 ips half track stereo non-sticky shed polyester from Music Library	B-MUSIC TP-S A5276 76-4-22 v. 3	4000000000010019	ML-OR-001	ML poly 1 (7.5 ips poly half track stereo non-sss)	MDPI_400000000089021	1976	Polyester	7 in.	Half track	Stereo	7.5 ips		Scotch 2
39	M-0008-QR	7.5 ips half track stereo non-sticky shed polyester from Music Library	B-MUSIC TP-S A5457 75-5-29 v. 1	4000000000010019	ML-OR-001	ML poly 1 (7.5 ips poly half track stereo non-sss)	MDPI_400000000089039	1975	Polyester	7 in.	Half track	Stereo	7.5 ips		Scotch 2
47	M-0008-QR	7.5 ips half track stereo non-sticky shed polyester from Music Library	B-MUSIC TP-S A5457 75-5-29 v. 2	4000000000010019	ML-OR-001	ML poly 1 (7.5 ips poly half track stereo non-sss)	MDPI_400000000089047	1975	Polyester	7 in.	Half track	Stereo	7.5 ips		Scotch 2
54	M-0008-QR	7.5 ips half track stereo non-sticky shed polyester from Music Library	B-MUSIC TP-S A5457 75-5-29 v. 3	4000000000010019	ML-OR-001	ML poly 1 (7.5 ips poly half track stereo non-sss)	MDPI_400000000089054	1975	Polyester	7 in.	Half track	Stereo	7.5 ips		Scotch 2
62	M-0008-QR	7.5 ips half track stereo non-sticky shed polyester from Music Library	B-MUSIC TP-S A5457 75-5-29 v. 4	4000000000010019	ML-OR-001	ML poly 1 (7.5 ips poly half track stereo non-sss)	MDPI_400000000089062	1975	Polyester	7 in.	Half track	Stereo	7.5 ips		Scotch 2
70	M-0008-QR	7.5 ips half track stereo non-sticky shed polyester from Music Library	B-MUSIC TP-S A5472 75-4-22 v. 1	4000000000010019	ML-OR-001	ML poly 1 (7.5 ips poly half track stereo non-sss)	MDPI_400000000089070	1975	Polyester	7 in.	Half track	Stereo	7.5 ips		Scotch 2
88	M-0008-QR	7.5 ips half track stereo non-sticky shed polyester from Music Library	B-MUSIC TP-S A5472 75-4-22 v. 2	4000000000010019	ML-OR-001	ML poly 1 (7.5 ips poly half track stereo non-sss)	MDPI_400000000089088	1975	Polyester	7 in.	Half track	Stereo	7.5 ips		Scotch 2
96	M-0008-QR	7.5 ips half track stereo non-sticky shed polyester from Music Library	B-MUSIC TP-S A5472 75-4-22 v. 3	4000000000010019	ML-OR-001	ML poly 1 (7.5 ips poly half track stereo non-sss)	MDPI_400000000089096	1975	Polyester	7 in.	Half track	Stereo	7.5 ips		Scotch 2
04	M-0008-QR	7.5 ips half track stereo non-sticky shed polyester from Music Library	B-MUSIC TP-S A5496 79-4-11 v. 1	4000000000010019	ML-OR-001	ML poly 1 (7.5 ips poly half track stereo non-sss)	MDPI_400000000089104	1979	Polyester	7 in.	Half track	Stereo	7.5 ips		Scotch 2
12	M-0008-QR	7.5 ips half track stereo non-sticky shed polyester from Music Library	B-MUSIC TP-S A5496 79-4-11 v. 2	4000000000010019	ML-OR-001	ML poly 1 (7.5 ips poly half track stereo non-sss)	MDPI_400000000089112	1979	Polyester	7 in.	Half track	Stereo	7.5 ips		Scotch 2
20	M-0008-QR	7.5 ips half track stereo non-sticky shed polyester from Music Library	B-MUSIC TP-S A5678 78-12-7 v. 1	4000000000010019	ML-OR-001	ML poly 1 (7.5 ips poly half track stereo non-sss)	MDPI_400000000089120	1978	Polyester	7 in.	Half track	Stereo	7.5 ips	15 mil	Scotch 2
38	M-0008-QR	7.5 ips half track stereo non-sticky shed polyester from Music Library	B-MUSIC TP-S A5678 78-12-7 v. 2	4000000000010019	ML-OR-001	ML poly 1 (7.5 ips poly half track stereo non-sss)	MDPI_400000000089138	1978	Polyester	7 in.	Half track	Stereo	7.5 ips	15 mil	Scotch 2
46	M-0008-QR	7.5 ips half track stereo non-sticky shed polyester from Music Library	B-MUSIC TP-S A5773 G7-1 v. 1	4000000000010019	ML-OR-001	ML poly 1 (7.5 ips poly half track stereo non-sss)	MDPI_400000000089146	1978	Polyester	7 in.	Half track	Stereo	7.5 ips		Scotch 2

Memnon Digitization

Ultrasonic cleaning of LP



Memnon Digitization

4:1 LP digitization



Memnon Digitization

4:1 Tape digitization



Memnon Digitization

Video digitization



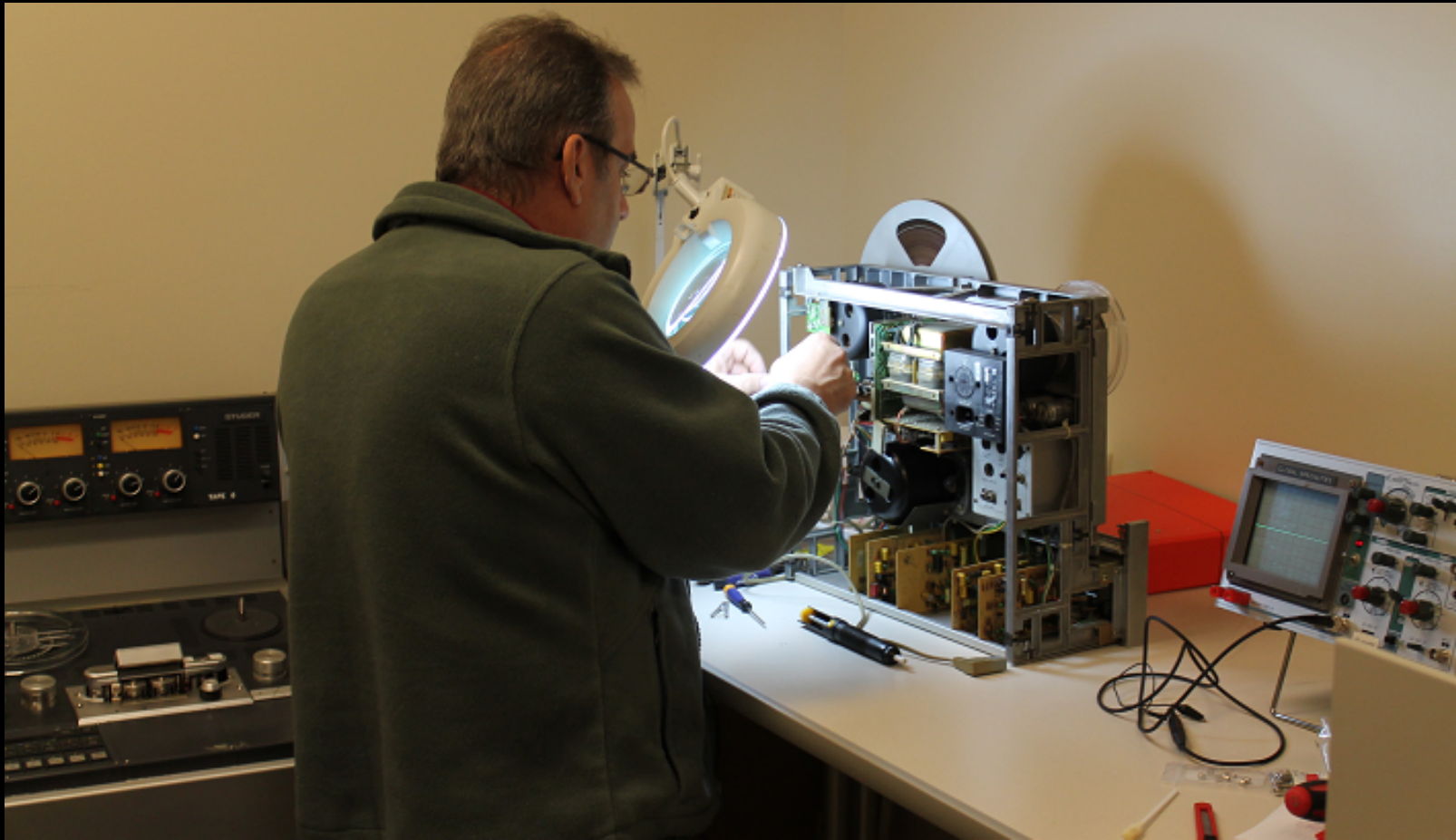
Memnon Digitization

Quality control



Memnon Digitization

Full time maintenance engineer



IU Media Digitization Studios

Audio preservation

- 7,000 field cylinders, lacquer discs, mixed speed tapes, wire recordings
- *Sound Directions* 1:1 workflow





IU Media Digitization Studios

Video preservation

- Hi 8/8mm, Betamax, 1/2" EIAJ
- Problem VHS, Umatic, Betacam SP





IU Media Digitization Studios

Productivity

- Theory of Constraints
- Scripts
- Scrum methodology
 - Jira backlog
 - Two week sprints





MDPI Quality Control

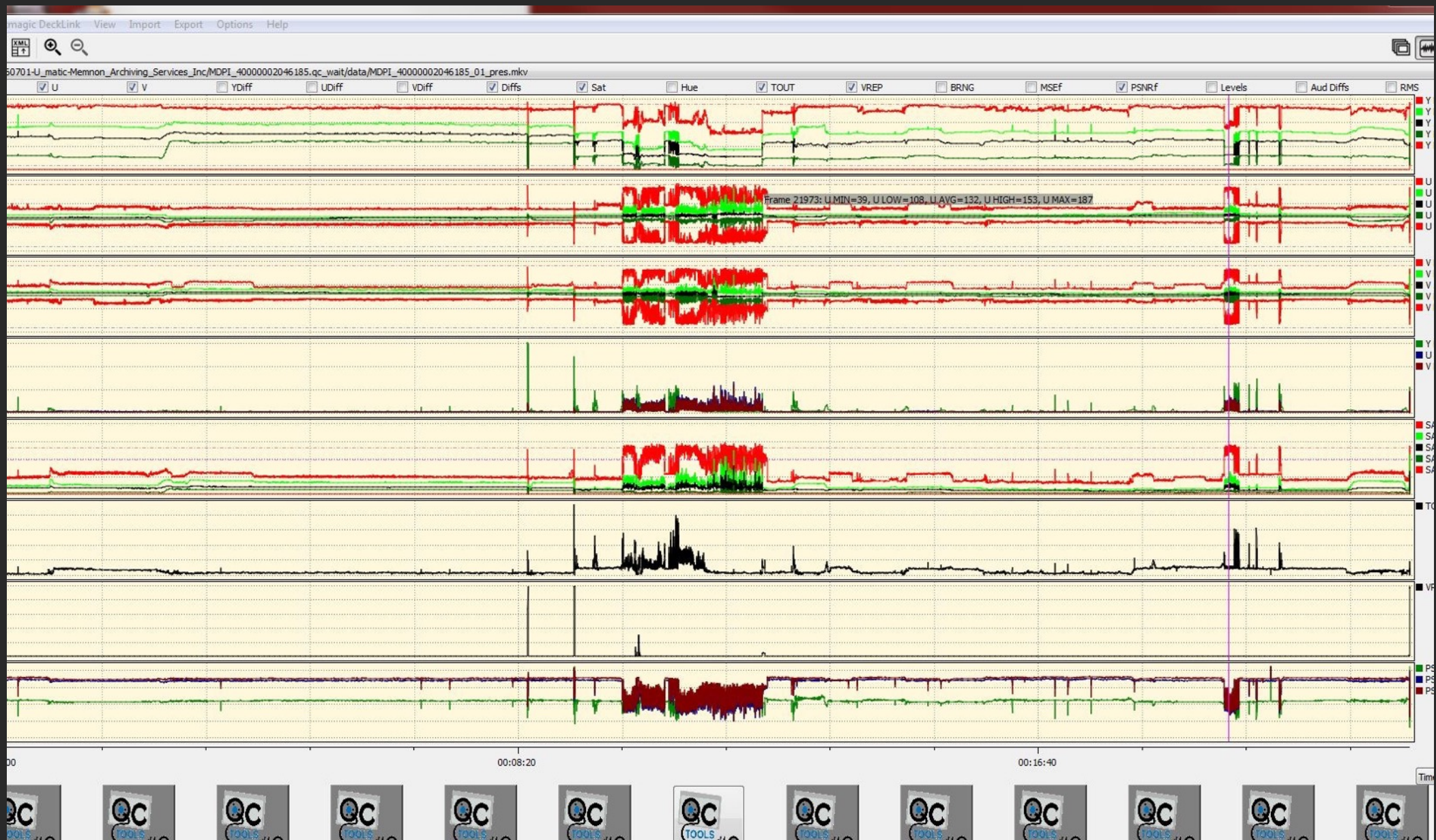
- QC preservation master files and derivatives
- Average package size
 - Betamax 78.6 GB
 - 8 mm 72.4 GB
 - VHS 95.2 GB
- QC workstations - 10 Gb connection over 50 micron multi mode fiber



MDPI Quality Control

- Random sample
- Visual/aural/metadata inspection







MDPI Quality Control

- 100% QC Specialist
- ~50% Processing and QC Specialist
- ~25% AV Specialist
- Hourly students--2



MDPI Post-Processing Workflow

- Transcode—create access derivatives
- Embed metadata
- Collect metadata for SIP
- Structural QC
- Make files available for QC
- Push to long-term storage
- Push to access system
- Fully automated



MDPI Storage

- Bit Storage:
 - IU Scholarly Data Archive (SDA)
 - Mirrored between IUB and IUPUI
 - Dual write over fiber
 - 42 PB tape capacity
 - Disk cache front end—1800 TB



Preservation Repository

- HydraDAM2 (Phydo)
- IU Libraries NEH-funded collaboration with WGBH/Boston, 2015-2016
- For time-based media
- Based on:
 - Fedora 4 digital repository software
 - Hydra framework



Preservation Repository

- Metadata and preservation event management tool
- Sits on top of storage



Access: Avalon Media System

- Co-developed by IU and Northwestern University Libraries
- Currently in production at:
 - IU
 - NW
 - University of Virginia
 - Yale
 - Washington University, St. Louis
 - University of Alberta
 - Calvin College
 - Qatar National Library



Access: Avalon Media System

- Open source software system
- Enables libraries and archives to provide access to audio and video collections



Access: Avalon Media System

- 2010-2011: IMLS Planning Grant
- 2011-2015: IMLS National Leadership Grant
- 2015-2018: Andrew W. Mellon Foundation
- 2017-2019: IMLS National Leadership Grant




Access: Avalon Media System

- SaaS—pilot hosted service
- LYRASIS
- Fall 2017



IU Media Collections Online

Avalon Media System

INDIANA UNIVERSITY

Sign in

Media Collections Online

Browse

Search

Browse by

Format >

Moving Image (360)

Sound Recording (9)


Date >

Genres >

Collection >


Unit >

Featured Film




The Masters of Disaster (1985)

Featured Film Collection



Indiana University Libraries Moving Image Archive

Featured Audio Collection




Birch Bayh Senate Hearings

Media Collections Online houses audio and video collections.

- Use the search box, or browse using the terms on the left side to discover content.
- Some content is only available when you sign in with your ID and passphrase.
- Login to Oncourse or Canvas to access course materials.

Visit Media Collections Online services web site to learn about services for IU units.



Media Collections Online is a service of Indiana University Libraries | Powered by Avalon | Contact Us

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avalon

MEDIA SYSTEM

Unsolved Challenges

- Metadata at scale
 - Discoverability
 - AVPreserve consultation
- Rights at scale
 - IU Libraries Copyright Program Librarian
 - IU legal counsel engaged



Unsolved Challenges

Metadata at scale + Rights at scale =

Access at scale!

- IU Libraries Access Task Force
- Out of region storage for PB of data
 - DPN





Large-Scale Media Digitization

What has been done to date?

- Quick, non-scientific survey
- Help from IASA TC
- 42 projects



Large-Scale Media Digitization

What has been done to date?

- 90% undertaken outside the US
- 55% by broadcast organizations
- 19% by cultural heritage organizations
- Remainder by organizations holding both broadcast and cultural heritage materials



Large-Scale Media Digitization

What has been done to date?

- 43% include video
- 75% include audio
- 10% include film



Large-Scale Media Digitization

Implications?

The future *media* documentary record might emphasize:

- Audio holdings
- Broadcast collections
- Materials from outside the US



Large-Scale Media Digitization

Implications?

What has been digitized in quantity:

- Books
- Still images
- Manuscripts



Large-Scale Media Digitization

Implications?

If, indeed, film, video, and audio collections are not preserved...the digital libraries of the future will contain embarrassing gaps.

-- David J. Francis, former Chief, MBRS Division, Library of Congress



Survey of Progress in the US



Stanford University Libraries

- Stanford Media Preservation Lab—2007
- 4 full time staff
- High quality playback and capture of most common formats at Stanford



University of North Carolina Libraries

- Large-scale digitization supported by Mellon
- Smaller scale digitization underway for many years



University of Illinois Libraries

- Media preservation program—2011
- Campus-wide media preservation census completed 2014



New York Public Library

- Completed comprehensive assessment of media holdings with support from Mellon
- Reallocated existing resources to support media preservation
- Beginning large-scale digitization phase



Syracuse University Libraries

- Completed media preservation survey of special collections
- Planning for expanded digitization program





Technical Committee
Standards Recommended, Practices and Strategies

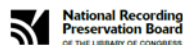
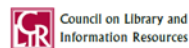
Guidelines on the Production and Preservation of Digital Audio Objects

IASA-TC04
Second Edition

<http://www.iasa-web.org>

ARSC Guide to Audio Preservation

Sam Brylawski, Maya Lerman, Robin Pike, Kathlin Smith, editors



SOUND DIRECTIONS

Best Practices for Audio Preservation

By Mike Casey, Indiana University and
Bruce Gordon, Harvard University

Media Preservation

10 things we have learned...



Media Preservation

1. Degradation may make digitization impossible or less accurate



Media Preservation

2. Obsolescence may make digitization prohibitively expensive



Media Preservation

3. Time frame is short



Media Preservation

4. Waiting longer will make the work more difficult and more expensive



Media Preservation

5. Foregrounding research and instructional value is critical



Media Preservation

6. Time-based media is underrepresented in digital libraries



Media Preservation

7. Standards and practices are ready for audio

- somewhat ready for video

- barely ready for film



Media Preservation

8. An increasing number of institutions are beginning to tackle these problems



Media Preservation

9. We don't have to do it all ourselves



Media Preservation

Hope is like a road in the country; there was never a road, but when many people walk on it, the road comes into existence.



---Lin Yutang

- Recognition of the value of AV for research
- New generation of media preservationists
- Increase in AV specialist positions in libraries
- University libraries taking action
- Open source movement
- New machines
- New software
- Skilled vendors



Degralescence is Brought under Control





The End

Why Media Preservation Can't Wait The ~~Gathering~~ Storm

Mike Casey

Director of Technical Operations

Media Digitization and Preservation Initiative

Indiana University

May 24, 2017

Website: <https://mdpi.iu.edu>