

CONSERVATION CENTER

for Art & Historic Artifacts

*Getting Started with
Obsolete Media*

Kaitlyn Pettengill
Digital Archives Specialist

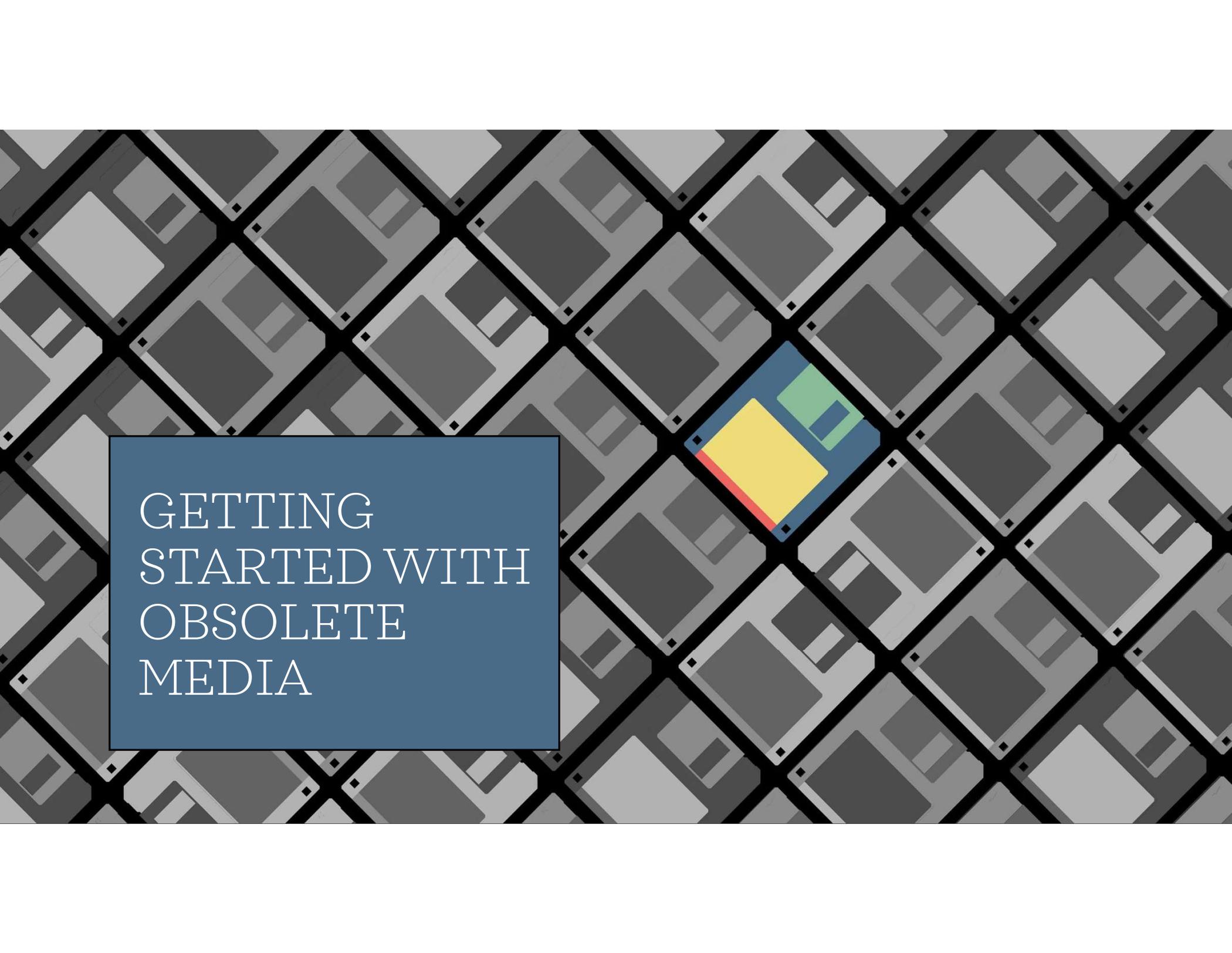


Conservation Center for Art & Historic Artifacts

In a typical year:

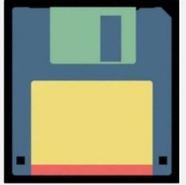
- Preservation Services specialists complete over 50 survey projects.
- Approximately 60 CCAHA-sponsored workshops, conferences, webinars, and training sessions are presented.
- The Digital Imaging Services staff digitizes thousands of pages of fragile archival documents, books, and photographs.
- Conservators assess and treat more than 6,000 individual artifacts, from over 400 clients.
- Housing & Framing Services house approx. 75% of the artifacts treated (folder, sleeve, box, mat and frame, or sealed package).





GETTING
STARTED WITH
OBSOLETE
MEDIA

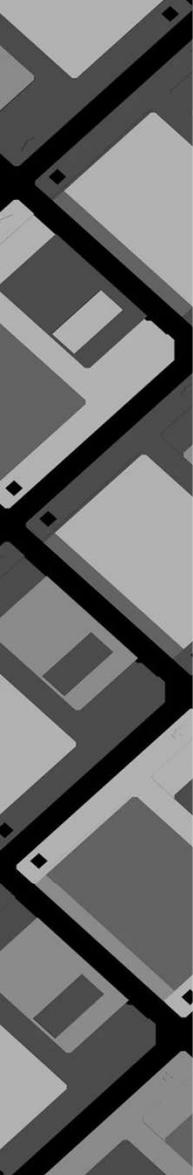
WHAT IS OBSOLETE MEDIA?



Media becomes obsolete when:

- Hardware is no longer manufactured
- Software/drivers are unsupported
- Knowledge of use has disappeared





FORMATS

Obsolete vs Endangered:

- **Obsolete media formats** are information storage formats that are no longer supported or manufactured.
- **Endangered media formats** are not yet obsolete, but are at high risk.

Two Different Responses:

- **Media migration** is when you move files to a new carrier.
- **Format migration** is when you convert the file into a new format.



MEDIA VS. ACCESS RISK

Several issues can lead to data degradation or loss:

Media Risk:

- **Bit rot** – gradual data corruption caused by errors in the bits (0s and 1s) that make up a file
- **Disc rot** – physical degradation of optical discs (CDs, DVDs) that makes data unreadable
- **Link rot** – loss of access to online content when links break or stop working

Access Risk:

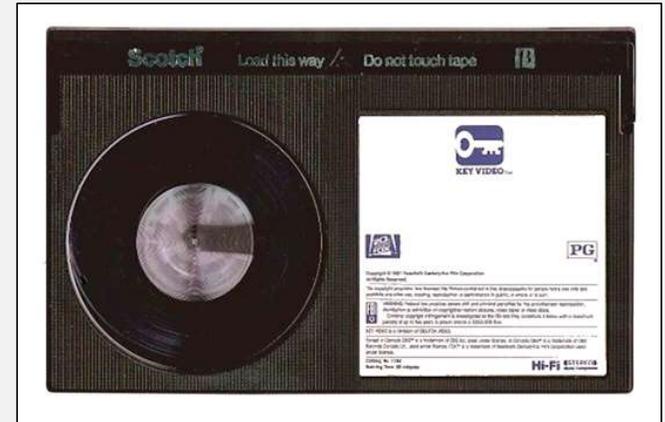
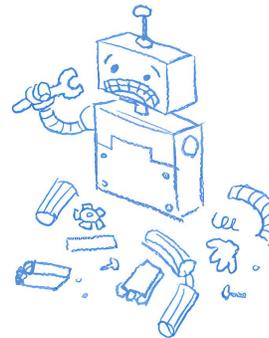
- **Technical obsolescence** – no working hardware or playback equipment to read the media
- **Software obsolescence** – no supported software to open the files



Google

404. That's an error.

The requested URL was not found on this server. That's all we know.





CARRIER FAILURE

- Sticky shed
- Disc rot
- Binder breakdown
- Environmental damage

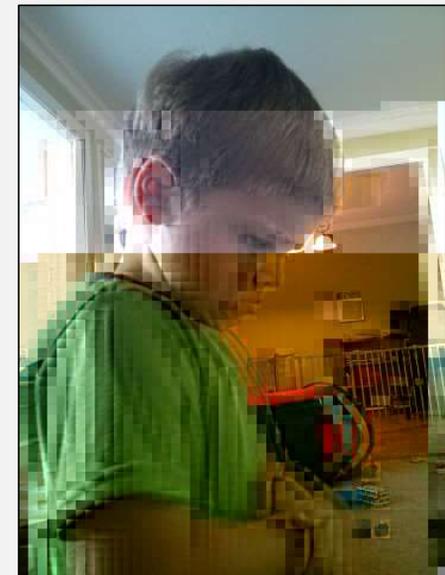
BIT ROT

Bit rot is a silent data corruption.

- Occurs at the binary level
- May not be visible immediately
- Often detected only during access attempts
- More common in unmanaged storage

Management response: fixity checking
& redundancy (multiple copies).

Recently I heard a term I hadn't heard before: "digital rot" In layman's terms, what is it, and what can be done about it?



DISC ROT

Disc rot is a physical layer failure.

- Delamination or dye breakdown
- Recordable discs degrade faster
- Often irreversible once advanced

Management response: prioritize migration off optical media.





MAGNETIC MEDIA FAILURE

Magnetic media can have physical and chemical instability.

- Binder breakdown (“sticky shed”)
- Playback can cause further damage
- Time-sensitive risk (1970s–80s tape especially)

Management response: Do not experiment — this is often vendor-level work.

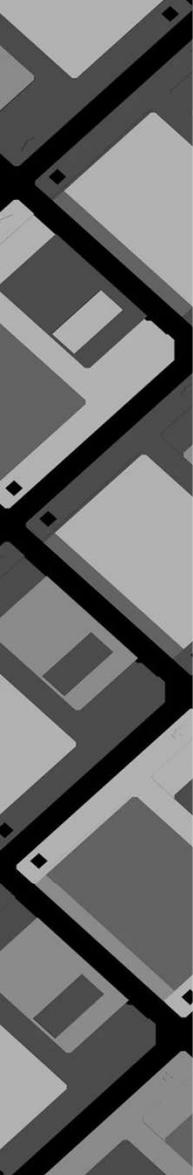
TECHNICAL OBSOLESCENCE

Technological obsolescence is a hardware & system dependency failure.

- No working playback equipment
- Missing ports or interfaces (e.g., SCSI, FireWire)
- Incompatible operating systems
- Device drivers no longer supported
- Specialized hardware no longer manufactured

The media and files may be intact, but the system required to access them no longer exists.





SOFTWARE OBSOLESCENCE

Software obsolescence is a format & platform dependency failure

- Proprietary file formats
- Unsupported audio/video formats
- Unsupported applications
- Platform-dependent environments
- Cloud-based systems with no clear way to export

The file exists, but the software ecosystem required to interpret it no longer does.

GLOBAL RISK SIGNALS: DPC BIT LIST

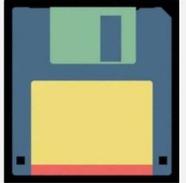
The Digital Preservation Coalition's Global "Bit List" of Endangered Digital Materials identifies digital content at the highest risk based on:

- Real-world loss patterns
- Platform dependency
- Legal and economic constraints
- Lack of preservation infrastructure

Categories range from Vulnerable, Endangered, Critically Endangered, and Practically Extinct.



COLLECTION-LEVEL TRIAGE



Rot and obsolescence are natural parts of the digital lifecycle.

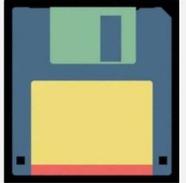
You can't prevent them entirely, but you can plan so that losing access to one copy doesn't mean losing everything.

Setting priorities: a major factor should be the volatility of the physical carrier, **but** other issues are at play.

- Volatility of the carrier
- Scarcity of playback equipment
- Institutional value and uniqueness

What are best practices for storing obsolete media (i.e. film vs tapes vs CDs)? What is the best way to name and label tapes with unknown content?

BORN-DIGITAL RISKS



Born-digital risk patterns:

- Platform dependency (software ecosystems)
- Proprietary or undocumented file formats
- Cloud storage without export control
- Authentication-based access systems
- Lack of institutional capture workflows
- No analog fallback

Can you speak to obsolete formats for born-digital materials or share guidance on preserving born-digital materials at risk of obsolescence? What materials are most at risk, and how can small institutions prepare?

BORN-DIGITAL FORMATS

Born-digital materials include photos taken with a digital camera, emails, and Excel spreadsheets. Anything that has no analog original in the “real world.” This is different from copies digitized with a scanner.

The Library of Congress has the Recommended Formats list:
<https://www.loc.gov/preservation/resources/rfs/>

| | | | |
|--------------------------|------------------------------|---|--|
| <u>Still Image Works</u> | Photographs - Digital | <ul style="list-style-type: none">> <u>TIFF</u> (.tif)> <u>JPEG2000</u> (.jp2)> <u>PNG</u> (.png)> <u>JPEG/JFIF</u> (.jpg) | <ul style="list-style-type: none">> <u>Photoshop</u> (.psd)> <u>JPEG2000 Part 2</u> (.jpf, .jpx)> <u>Digital Negative DNG</u> (.dng)> Proprietary <u>Camera Raw formats</u> (.nef, .crw, .arw, .iiq)> <u>GIF</u> (.gif) |
|--------------------------|------------------------------|---|--|



WHAT TO DO WHEN YOU FIND OLD MEDIA

Step 1: Pause! Don't plug it in yet

Step 2: Stabilize physically

Step 3: Document before action

Step 4: Decide on your path

IDENTIFYING THE FORMAT

The format determines the playback path.

The playback path determines the preservation strategy.



WHAT YOU MIGHT HAVE

- Compare physical characteristics (size, cassette window, labeling)
- Check trusted identification guides (Museum of Obsolete Media, PSAP)
- Do not experiment with “closest looking” equipment!

Sites to help identify the media type:

<https://obsoletemedia.org/>

<https://psap.library.illinois.edu/collection-id-guide>

https://www.youtube.com/watch?v=NIINR_LM7G4&t

<https://www.arts.texas.gov/wp-content/uploads/2012/04/video.pdf>



FLOPPY DISKS: PRACTICAL ADVICE

What usually works:

- Modern USB 3.5" floppy drives (for basic disks)
- Write-blockers (if available)
- Creating disk images rather than copying individual files

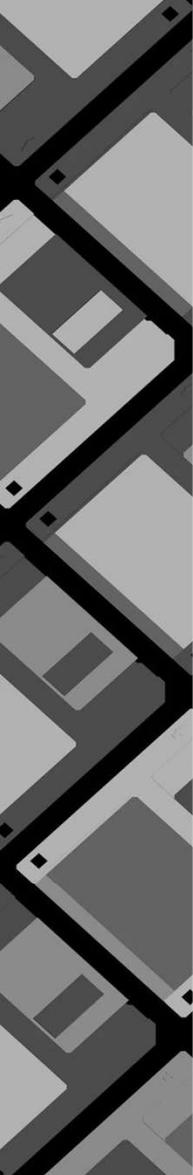




AFTER DATA IS RETRIEVED: NOW WHAT?

Immediate steps:

- Move files off removable media
- Store on managed storage (server, backed-up drive)
- Create at least two copies in different locations

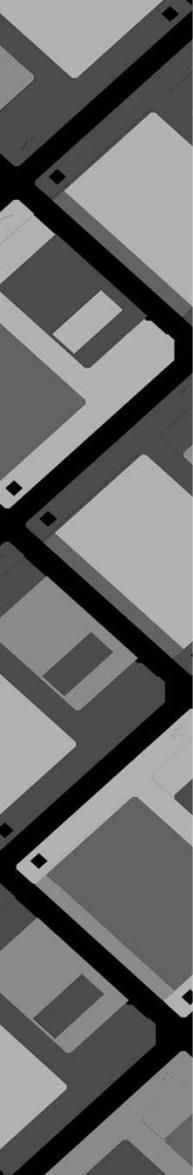


CREATING A DIGITAL ASSET REGISTER

A Digital Asset Register documents:

- What you have
- Where it lives
- What format it is
- What media it's stored on
- What risks are associated

What are best practices for storing obsolete media (i.e. film vs tapes vs CDs)? What is the best way to name and label tapes with unknown content?



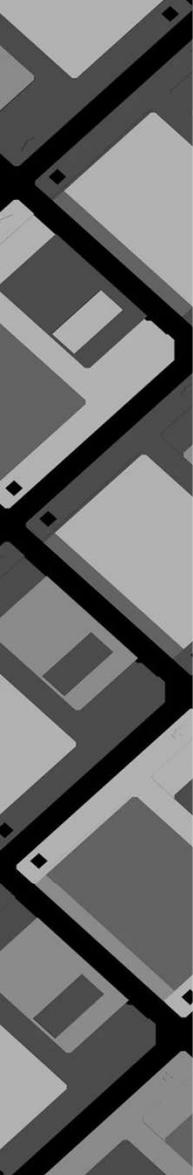
DIY OR VENDOR?

Hidden costs of DIY:

- Staff time
- Metadata gaps
- Rework later
- Equipment maintenance
- Legal exposure

When DIY actually makes sense:

- Stable formats (e.g., non-damaged CDs)
- Access copies only
- Pilot batches
- Skill-building projects



WORKING WITH VENDORS

Have a clear agreement on issues such as file naming and metadata creation.

Some metadata can be embedded in files, which takes more time but reduces the likelihood of separation.

- Documentation expectations
- Chain of custody
- Metadata return standards
- Storage handoff clarity



CONVERSION BASICS

Conversion is a policy decision.

Conversions should include both preservation copies and access copies.

- What condition is the physical carrier in?
- What playback machines are required?
- What connecting items – cords, etc. – are needed?
- What software is needed?



FILE IDENTIFICATION & VALIDATION TOOLS

DROID

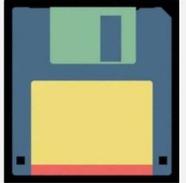
- Identifies file formats using PRONOM signatures
- Useful for surveying unknown collections

PRONOM / PREMIS

- Verify file format signatures
- Detect mismatches between extension and content

You cannot migrate or preserve what you have not correctly identified.

PRACTICAL NEXT STEPS



Inventory what you have

- Create a Digital Asset Register (a spreadsheet is fine)
- Include media type, format (if known), approximate date, storage location, and labels

Identify risk

- Flag at-risk media, formats, or systems
- Note playback equipment requirements

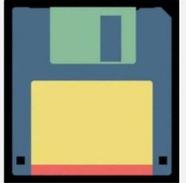
Stabilize storage

- Ensure at least two copies in different locations
- Move files off removable media into managed storage

Plan ahead

- Set a migration schedule based on risk and cost

FURTHER RESOURCES



Obsolete Media & Devices

Museum of Obsolete Media: <https://obsoletemedia.org/>

NEDCC Fundamentals of AV Preservation: <https://www.nedcc.org/av-textbook>

DHPSNY “Identifying Endangered Media Formats”: https://youtu.be/NIINR_LM7G4

Born-Digital Media

Endangered Digital Species List: <https://www.dpconline.org/digipres/champion-digital-preservation/bit-list>

LOC Recommended Formats: <https://www.loc.gov/preservation/resources/rfs/>

LOC Personal Digital Archiving: <https://digitalpreservation.gov/personalarchiving/>

ALA LibGuide on Digital Preservation: <https://libguides.ala.org/libpreservation/digitalpreservation>