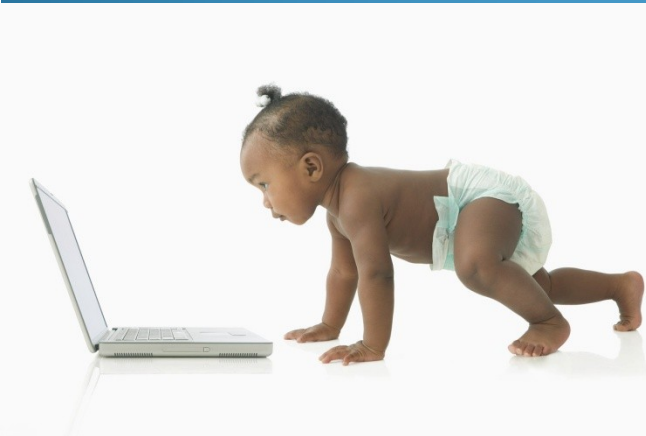


Preserving Your Family History Records Digitally



Gary T. Wright

October 2010

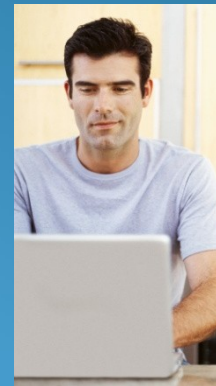
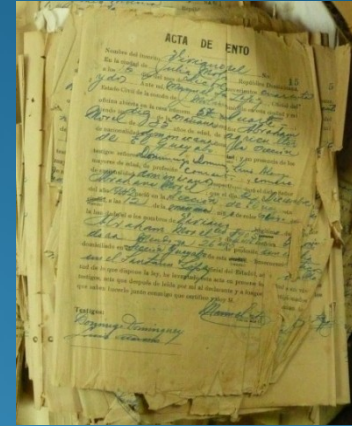
Agenda

- Benefits and challenges of using digital preservation to both augment and enhance preservation of your family records
- Solutions
- Getting started
- *Note: a paper with more detail is available*



Why Digital Records?

- No worry about physical records being too fragile to handle
- Color and contrast don't fade with time
- Copies are as good as the original
- Records can be much easier to organize, use, share, and print
- Easy access, small storage space
- More and more records are being created digitally (born-digital)



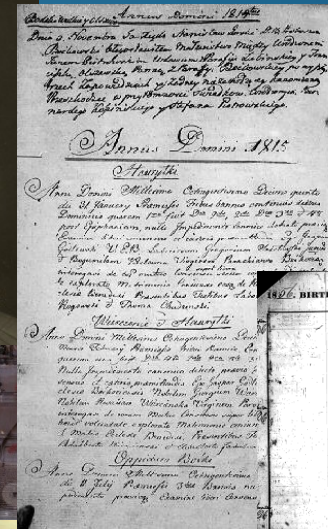
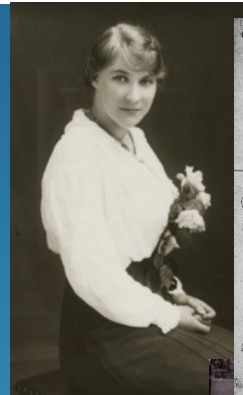
Digital Record Requirements

- A personal computer with appropriate software
- Internet access
- Ability to digitize physical and analog records
- Digital preservation



What Types of Records Can Be Digitized?

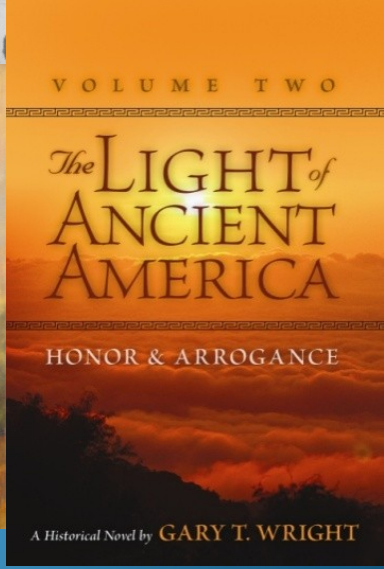
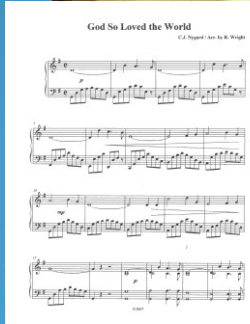
- Photographs
- Documents and journals
- Written and audio histories
- Newspaper clippings
- Family videos
- Music and artwork
- Books
- Bible pages and vital records



Page 116.

1919 BIRTHS in the Parish of St. Andrew's in the County of St. Andrew's

No.	Christian Name	Sex	Age of Mother	Place of Birth	Place of Birth	Place of Birth	Place of Birth	Place of Birth	Place of Birth
141	John	M	28	St. Andrew's	St. Andrew's	St. Andrew's	St. Andrew's	St. Andrew's	St. Andrew's
142	Mary	F	28	St. Andrew's	St. Andrew's	St. Andrew's	St. Andrew's	St. Andrew's	St. Andrew's
143	John	M	28	St. Andrew's	St. Andrew's	St. Andrew's	St. Andrew's	St. Andrew's	St. Andrew's
144	Mary	F	28	St. Andrew's	St. Andrew's	St. Andrew's	St. Andrew's	St. Andrew's	St. Andrew's
145	John	M	28	St. Andrew's	St. Andrew's	St. Andrew's	St. Andrew's	St. Andrew's	St. Andrew's
146	Mary	F	28	St. Andrew's	St. Andrew's	St. Andrew's	St. Andrew's	St. Andrew's	St. Andrew's
147	John	M	28	St. Andrew's	St. Andrew's	St. Andrew's	St. Andrew's	St. Andrew's	St. Andrew's
148	Mary	F	28	St. Andrew's	St. Andrew's	St. Andrew's	St. Andrew's	St. Andrew's	St. Andrew's
149	John	M	28	St. Andrew's	St. Andrew's	St. Andrew's	St. Andrew's	St. Andrew's	St. Andrew's
150	Mary	F	28	St. Andrew's	St. Andrew's	St. Andrew's	St. Andrew's	St. Andrew's	St. Andrew's



What Is Digital Preservation?

- It is **NOT** simply backing up your data!
- **It IS the process of . . .**
 - storing digital records with descriptive information
 - for a very long time in multiple locations,
 - at the highest resolution affordable,
 - and migrating data to new storage media to prevent data loss or inability to read the data,
 - and changing formats before they become obsolete,
 - so your posterity can always access their heritage!



Digital Preservation Challenges

- Digital “bits” cannot be seen or felt
- They must be written to a storage medium that is computer readable
- They must be stored in a file format that computer software can interpret and render
- Storage media decompose over time, causing bit loss—which in turn causes data loss
- File formats and storage technologies tend to become obsolete over time

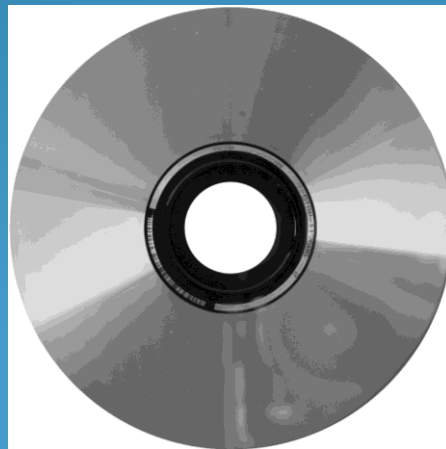
10011011100001011



PDF **Word**
JPEG

Storage Media Archival Life

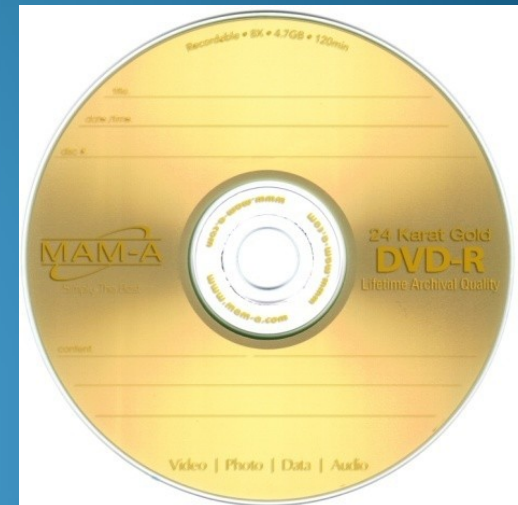
- Commodity CD or DVD 3 – 5 years
- Hard drive 3 – 5 years
- USB flash drive Unknown



Archival Storage Media Solutions

Archive-grade, dye-based optical discs

- Feature 24 karat gold reflective layer and anti-UV protection (CD only) to extend data life
- Write and read with standard drives
- To maximize archival life—(1) write at half the top rated speed, (2) ≤ 4.2 GB per DVD, (3) store the disc away from light, (4) don't label the top of it, (5) and store it vertically in a jewel case



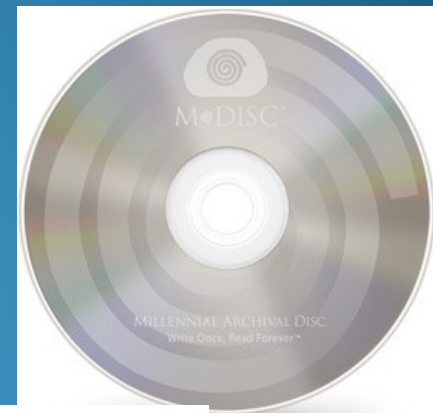
Archival Storage Media Solutions

Millenniata M-DISC™

- 1000 year archival life — a breakthrough!
- U.S. Naval Air Warfare Center testing result—*“None of the Millenniata media suffered any data degradation at all.”*
- High powered laser etches synthetic stone
- Read with standard DVD drives
- No special storage requirements



millenniata.com



Optical Disc Storage Capacities

<u>Type</u>	<u>Capacity</u>	<u>Number of Files</u>
• CD	650 MB	650 x 1 MB files
• DVD	4.2 GB	4200 x 1 MB files
• Blu-ray*	47 GB	47,000 x 1 MB files
• CD		260 x 2.5 MB files
• DVD		1680 x 2.5 MB files
• Blu-ray*		18,800 x 2.5 MB files

*no archive-grade Blu-ray discs available

Addressing Obsolete Storage Technologies

Device archiving—preserve hardware to read and render records

- M-DISC example—archive an extra DVD drive for future use
 - Risk 1—DVD drive doesn't work when you need it!
 - Solution—archive multiple drives
 - Risk 2—future computer doesn't support DVD drives!
 - Solution—archive DVD device software also
- Not a viable approach for most people



Addressing Obsolete Storage Technologies

Migration—copy to replacement storage media (media refresh)

- M-DISC example—copy records to future Blu-ray M-WRITER
 - Risk—procrastination! (i.e., you can't read records for whatever reason and so can't copy)
 - Solution—don't procrastinate!
- A viable approach, but may require your posterity to do the work
 - Prepare them!



Addressing Obsolete Storage Technologies

Some encouragement and direction

- Blu-ray Disc Association recommended that Blu-ray disc drives be capable of reading standard DVDs
- Most drives sold today offer DVD compatibility
- It is reasonable to expect DVD technology to be around for years to come!



Addressing Obsolete Storage Technologies

More encouragement and direction

- LP phonograph records—why can you still buy needles and turntables?
- There is still a market for playing them . . . nearly 80 years after introduction!
- As you invest in archive-grade storage media, you are building such a market
- *Carpe diem!*



*Image courtesy of
Felipe Micaroni Lalli
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Preservation File Format Challenges

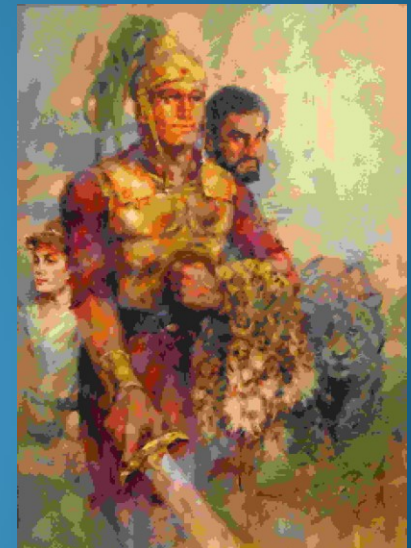
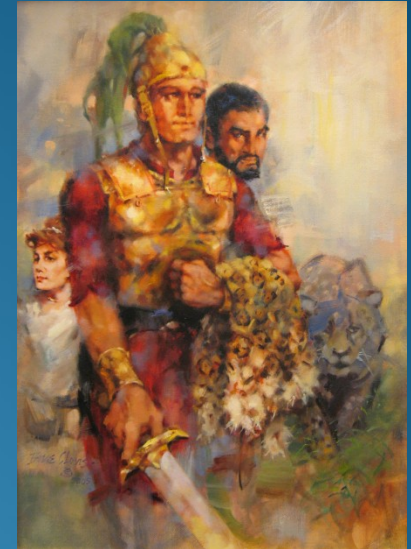
- File formats change frequently and become obsolete

(consider WordStar as an example)

TIFF 14,019 KB

- File size—TIFF provides high resolution preservation masters . . . but occupies lots of storage capacity

- JPEG compresses data to save storage capacity . . . but significantly lowers image resolution



JPEG 98 KB

Preservation File Format Solutions

PDF/A (.pdf) — a digital preservation breakthrough!

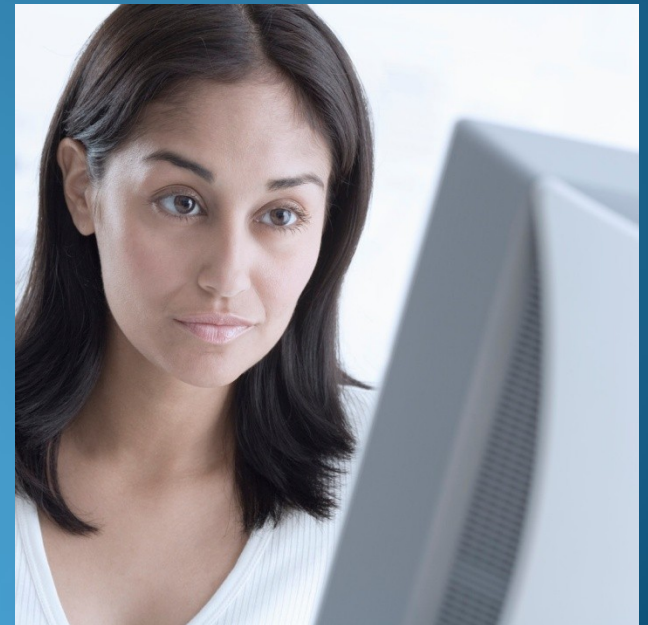
- October 2005 ISO standard based on PDF 1.4
ISO-19005-1 — Electronic document file format for long-term preservation
- 100% self-contained and self-documenting—all information necessary for rendering is embedded as XMP metadata (content, fonts, color information, etc.—uses software archiving)
- No reliance on external sources (including links)
- No audio/video content; no encryption



Preservation File Format Solutions

Examples of PDF/A Creation Software

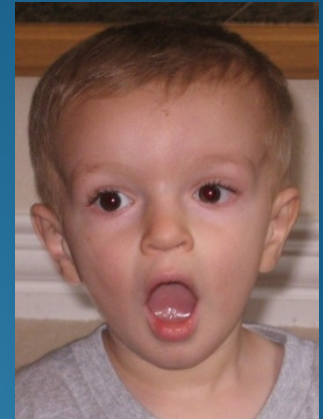
- Adobe Acrobat
- soft Xpansion Perfect PDF Master
(free for personal use)
- Nuance PDF Converter
- Solid Documents PDF Creator



Preservation File Format Solutions

JPEG 2000 (.jp2 or .j2k) — another breakthrough!

- September 2004 ISO Standard
ISO/IEC-15444-1 — image coding system
- Improvement upon 1992 JPEG standard
- Features both lossy and lossless compression
- Lossless compression maintains resolution quality while typically saving 50-60% storage capacity
- Growing in popularity with the preservation industry



Preservation File Format Solutions

Examples of JPEG 2000 Creation Software

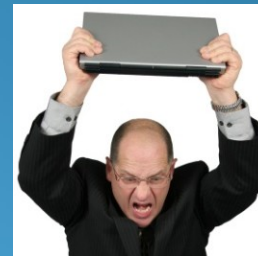
- Adobe Acrobat and Photoshop
- FastStone Image Viewer
(free for personal use)
- XnView (free for personal use)
- ACDSee Photo Editor
- Corel PaintShop Photo Pro



Preservation File Format Solutions

Software testing results—

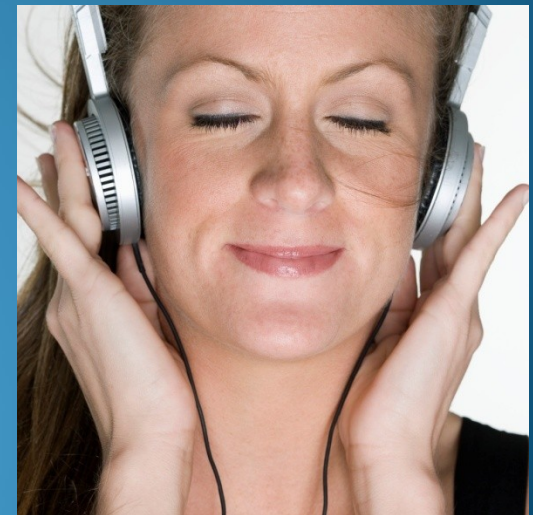
- Lossless JPEG 2000 files created from a 14 MB TIFF file resulted in a compression benefit of 61% for all products
- Solid PDF Creator Plus creates PDF/A files with lossless JPEG 2000 qualities
 - bug uncovered, fix committed
- soft Xpansion Perfect PDF Master (**free for personal use**) does not allow addition of descriptive information when creating PDF/A files—must purchase business version



Preservation File Format Solutions

Digital Audio

- Use WAV, the Waveform Audio File Format (.wav)
- Compatible with Windows and Mac OS
- Avoid other formats such as MP3 and SD2
- WAV creation software is plentiful (search on “free WAV software”)



Preservation File Format Solutions

Digital Video

- For Mac OS, use QuickTime (.mov)
- For Windows, use either the Audio Video Interleave (AVI) container format (.avi) or QuickTime (.mov)
- Avoid other formats such as Flash, MPEG-2, and MPEG-4
- QuickTime is integrated with Mac OS X
- AVI is part of Microsoft Video for Windows and is integrated with recent versions of Windows



Addressing Obsolete File Formats

Migration—convert to replacement file formats (transformation)

- JPEG 2000 example—convert to JPEG ? while conversion software is available
- Perhaps combine with media refresh
- Stay in touch with preservation technology to avoid unpleasant surprises
- May require your posterity to do the work
 - Prepare them!



Getting Started With Digital Preservation

File Format Software (PDF/A, JPEG 2000, WAV, AVI, etc.)

Scanner

- 300 dpi adequate if printing same size as original
- ≥ 1200 dpi if printing larger than original
- 4800 dpi scanners are available



Digital Camera

- Natural, flat, uniform lighting (avoid shadows/reflections)
- Use a tripod; keep lens parallel to object; maximize dpi



Getting Started With Digital Preservation

Audio Digitizer

- USB device
- Converts any analog to digital



DVD Writer

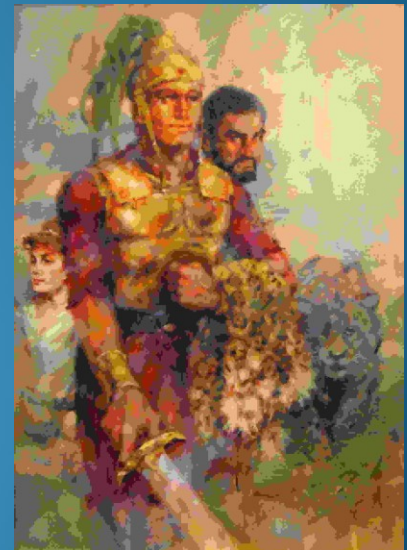
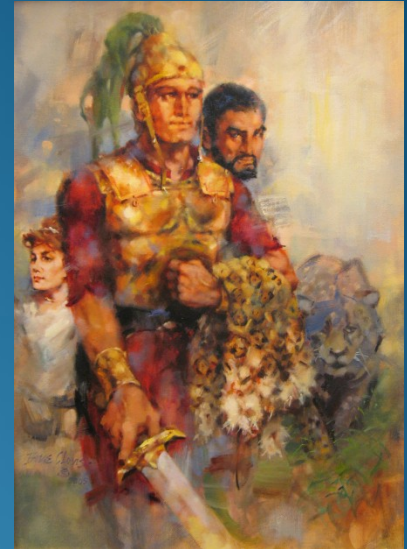
- May be included with your computer
- If not, any name brand will write and read gold archive-grade optical discs
- For Millenniata M-DISCs, use only Millenniata M-Writer (consider spreading the cost with family, friends, etc.)



Getting Started With Digital Preservation

Preserve your records at the highest resolution for which you can afford the archival storage

- Resolution quality cannot be improved once a digital record is created
- Since you don't know how the record will be used in the future, maximize resolution today
- Set device dpi setting to highest option so source files will have maximum resolution
- After you create JPEG 2000 preservation versions, delete source files



Getting Started With Digital Preservation

Before preserving records, add as much descriptive information (contextual and historical) as possible—otherwise neither you nor your posterity will easily understand the records

- Name or rename files with descriptive information
- Do this immediately after creating or loading a file—or you will probably never get around to it!
- Example—



110237489853.tif

versus



Esther Elizabeth Knight on her
wedding day 8 May 1917.tif

Getting Started With Digital Preservation

To complete the descriptive information—

- Add reference information (tags) when creating the file
- This requires software that will allow the addition of metadata—**unfortunately, free software may not do this!**
- Example—
- Keywords enhance searching!

Document Information

Title: Esther Elizabeth Knight on her wedding day 8 May 1917

Subject: Esther Elizabeth Knight wedding picture

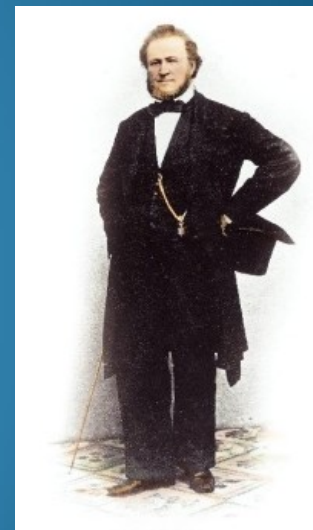
Author: In the public domain (photo taken before 1923)

Keywords: Esther, Knight, wedding, 1917, bride, photo,

Getting Started With Digital

Do not violate copyright law!

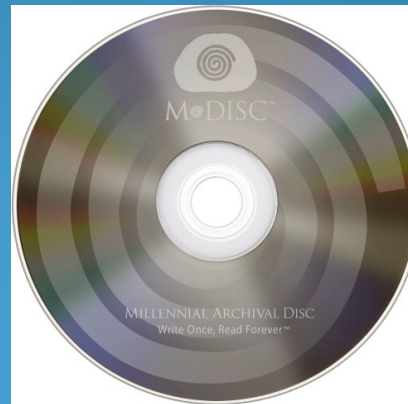
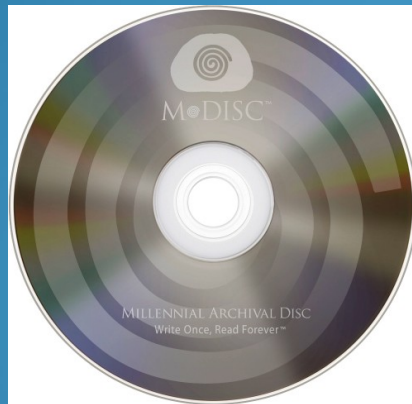
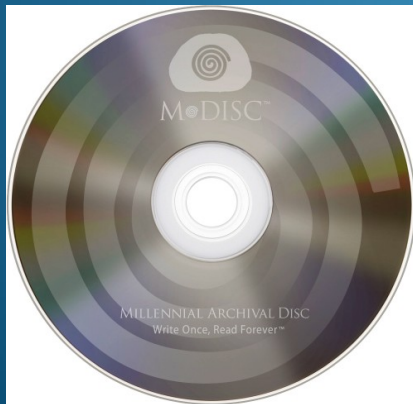
- Track down the source/owner of each record
- Apply copyright law for each source
(see *Copyright Fundamentals for Genealogy* by Mike Goad)
- Most pre-1923 works are in the public domain
- *Copyright applies to physical records too!*



Getting Started With Digital Preservation

Make at least two copies and store them in different locations

- Three copies in three locations is even better!
- LOCKSS is a preservation principle and solution—
"Lots Of Copies Keep Stuff Safe!"



Getting Started With Digital Preservation

Periodically test your digital records (at least annually)

- Open files randomly and look for errors
- If an error is found, check the second copy
- If good, copy that disc and eliminate the flawed one
- If all copies are flawed, copy error-free files to new archival storage media
- **LOCKSS!**



Getting Started With Digital Preservation

If you want to share your digital records—

- Yahoo email is free and offers unlimited storage capacity
- Such an Internet email service may be used for archive backup . . .
- **but not for digital preservation!**
- If files are too large to email, use www.YouSendIt.com or www.TransferBigFiles.com

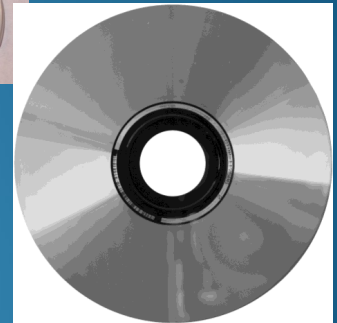


As Time Goes By . . .

. . . you and your posterity must monitor technology changes and take appropriate actions—

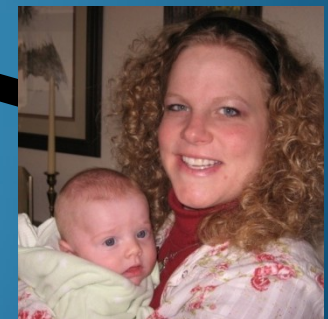
WordStar

- Transform file formats that are becoming obsolete to their replacement formats
- Copy files to newer media to prevent data loss (depending on type of archival storage media used)
- Migrate files to newer storage media so they can continue to be read if existing read devices are becoming obsolete



The Realities of Digital Preservation

- Digital preservation is not a one-time event
- Nor is it a one-generation project
- Your responsibility is to digitize and preserve records the best you can, then pass them on to the next generation
- Yes, it's a lot of work . . .
- but the payback will be eternal!

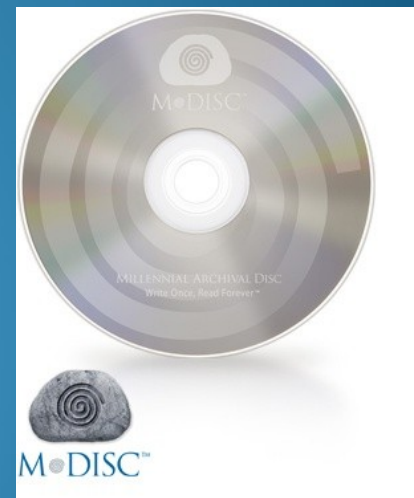


5 generations

Breaking News!

Introducing a personal archiving Internet service

- Upload the files you want to preserve (with metadata!)
- They are written to a Millenniata M·DISC (up to 4.2 GB)
- The files are indexed with **PerfectSearch**
- Receive your archived records on an M·DISC that has **PerfectSearch** full-text search and can be accessed by any DVD drive
- See www.LegacyDox.com



Final Thoughts

- Augment and enhance physical preservation
- Get started now . . . don't put it off
- Have fun, especially as you connect with your memories and ancestors
- Recruit others
- Sleep better at night!



Preserving Your Family History Records Digitally



Thank you!

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Questions?