Digital Imaging Standards

Preservation Division

LDS Church History Library

THE CHURCH OF JESUS CHRIST OF LATTER-DAY SAINTS | Church History Department

About Us

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What We Do

- The preservation division is responsible for preserving the records of the LDS Church.
- We digitize & also collect born-digital material
- We currently have 1.06 Petabytes of data collected
- We captured 1.5 million images last year
- We use Rosetta to manage our preservation files

Why Standards?

"Standards are like toothbrushes. Everybody wants one but nobody wants to use anybody else's."

Made-Digital	Born-Digital
TIFF	JPG
MOV	PDF
DPX	DOC
WAV	XLS
	AVI
	MP3
	WMV

Where do I find the standards?

Made-Digital & Born-Digital

Capture Standards
http://www.digitizationguidelines.gov/guidelines/FADGI_Still_Image_Tech_Guidelines_2015-09-02_v4.pdf

Format Standards
http://www.digitalpreservation.gov/formats/fdd/descriptions.shtml

AV Standards
http://www.digitizationguidelines.gov/guidelines/Motion_pic_film_scan.html
http://www.digitizationguidelines.gov/audio-visual/

Where do I find the standards?

Photographs

FADGI

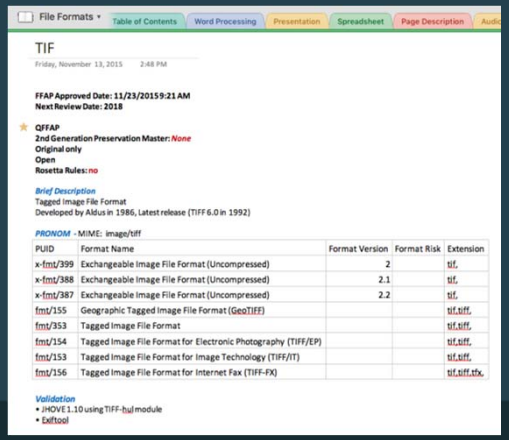
Performance Level:

	1 Star	2 Star	3 Star	4 Star
Master File Format	TIFF	TIFF	TIFF	TIFF
Access File Formats	All	All	All	All
Resolution	100 ppi	200 ppi	400 ppi	600 ppi[1]
Bit Depth	8	8	8 or 16	16
Color Space	Grey Gamma 2.2, SRGB, Adobe 1998, ECIRGBv2	Grey Gamma 2.2, Adobe 1998, ECIRGBv2	Adobe 1998, ECIRGBv2	Adobe 1998, ECIRGBv2
Color	Greyscale or Color	Greyscale or Color	Color	Color
Measurement Parameters				
Tone Response	>9 count levels	+ 9 count levels	+ 6 count levels	+ 3 count levels

Compliance to Standards

- We have adapted many of the FADGI guidelines to our processes.
- We use DROID and JHOVE to identify & validate formats.
- Refer to FFAP for identification and migration plans

FADGI Federal Agencies Digitization Guidelines Initiative



File Formats | Table of Contents | Word Processing | Presentation | Spreadsheet | Page Description

TIF

Friday, November 13, 2015 2:48 PM

FFAP Approved Date: 11/23/2015 9:21 AM
Next Review Date: 2018

QFFAP
2nd Generation Preservation Master: *None*
Original only
Open
Rosetta Rules: no

Brief Description
Tagged Image File Format
Developed by Aldus in 1986, Latest release (TIFF 6.0 in 1992)

PRONOM - MIME: image/tiff

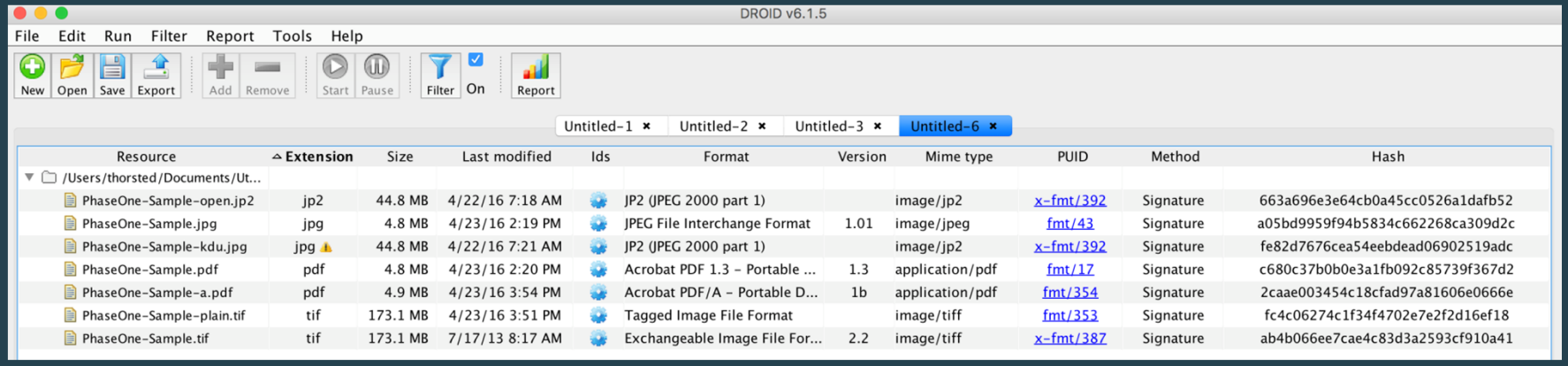
PUID	Format Name	Format Version	Format Risk	Extension
x-fmt/399	Exchangeable Image File Format (Uncompressed)	2		tif,
x-fmt/388	Exchangeable Image File Format (Uncompressed)	2.1		tif,
x-fmt/387	Exchangeable Image File Format (Uncompressed)	2.2		tif,
fmt/155	Geographic Tagged Image File Format (GeoTIFF)			tif,tiff,
fmt/353	Tagged Image File Format			tif,tiff,
fmt/154	Tagged Image File Format for Electronic Photography (TIFF/EP)			tif,tiff,
fmt/153	Tagged Image File Format for Image Technology (TIFF/IT)			tif,tiff,
fmt/156	Tagged Image File Format for Internet Fax (TIFF-FX)			tif,tiff,tfx,

Validation
- JHOVE 1.10 using TIFF-hul module
- Exiftool

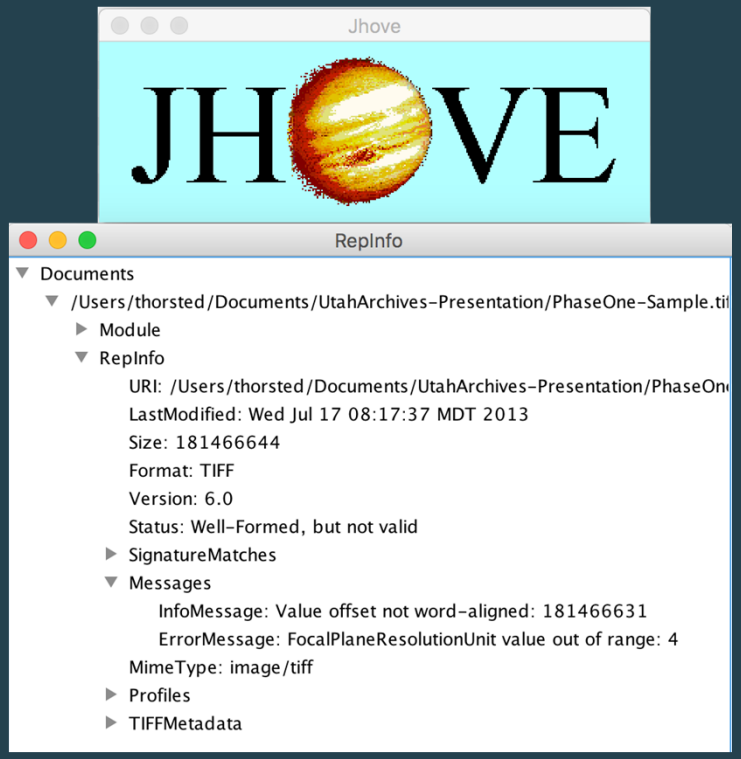
Compliance to Standards

DROID uses the PRONOM database

http://apps.nationalarchives.gov.uk/PRONOM/



Compliance to Standards



Our Capture Process

Our Capture Process

Still Images

Audio Visual

Our Capture Process

Still Images

Capture to uncompressed TIFF

Audio Visual

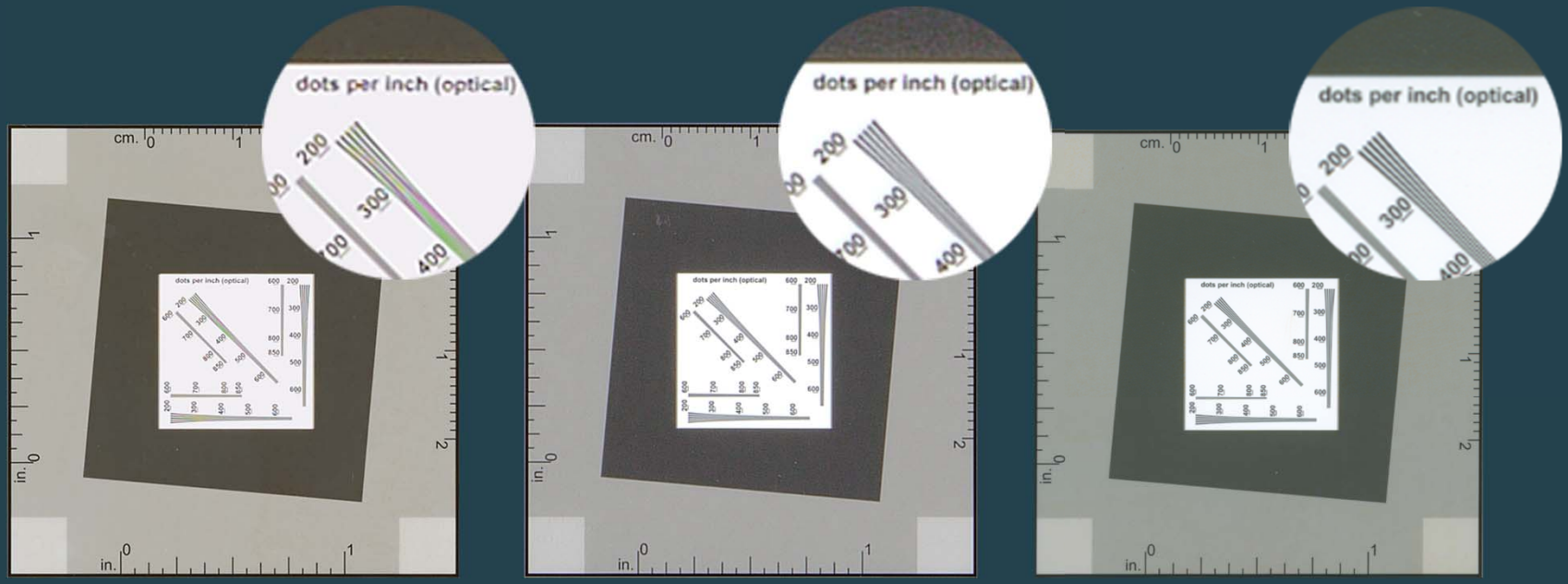
Video captured from tape as 10bit uncompressed

Motion Picture film captured as DPX images

Audio captured in 96kHz, 24 bit Broadcast WAVE

Case Study

Optical resolution & effective DPI



Case Study

Scanning Negatives

Case Study

Metadata

```
ExifTool Version Number         : 10.15
File Name                       : PhaseOne-Sample-plain.tif
Directory                       : .
File Size                       : 173 MB
File Modification Date/Time     : 2016:04:23 15:51:27-06:00
File Access Date/Time           : 2016:04:23 15:51:48-06:00
File Inode Change Date/Time     : 2016:04:23 15:51:27-06:00
File Permissions                : rw-r--r--
File Type                       : TIFF
File Type Extension             : tif
MIME Type                       : image/tiff
Exif Byte Order                 : Little-endian (Intel, II)
Image Width                     : 8984
Image Height                    : 6732
Bits Per Sample                 : 8 8 8
Compression                     : Uncompressed
Photometric Interpretation      : RGB
Fill Order                      : Normal
Strip Offsets                   : (Binary data 63202 bytes, use -b option to extract)
Orientation                     : Horizontal (normal)
Samples Per Pixel               : 3
Rows Per Strip                  : 1
Strip Byte Counts               : (Binary data 40391 bytes, use -b option to extract)
X Resolution                    : 300
Y Resolution                    : 300
Planar Configuration            : Chunky
Resolution Unit                 : inches
Page Number                     : 0 1
White Point                     : 0.3127000035 0.3289999963
Primary Chromaticities          : 0.6399999858 0.3300000132 0.300000012 0.600000024 0.150000006 0.05999999867
Image Size                      : 8984x6732
Megapixels                      : 60.5
```

```
ExifTool Version Number         : 10.15
File Name                       : PhaseOne-Sample-open.jp2
Directory                       : .
File Size                       : 45 MB
File Modification Date/Time     : 2016:04:22 07:18:24-06:00
File Access Date/Time           : 2016:04:22 07:20:32-06:00
File Inode Change Date/Time     : 2016:04:22 07:18:24-06:00
File Permissions                : rw-r--r--
File Type                       : JP2
File Type Extension             : jp2
MIME Type                       : image/jp2
Major Brand                     : JPEG 2000 Image (.JP2)
Minor Version                   : 0.0.0
Compatible Brands               : jp2
Image Height                    : 6732
Image Width                     : 8984
Number Of Components            : 3
Bits Per Component              : 8 Bits, Unsigned
Compression                     : JPEG 2000
Color Spec Method               : Enumerated
Color Spec Precedence           : 0
Color Spec Approximation        : Not Specified
Color Space                     : sRGB
Image Size                      : 8984x6732
Megapixels                      : 60.5
```

AV Standards

Motion Picture Scanning

35mm film @ 4K resolution

16mm film @ 2K resolution for prints and 4K for negatives

8mm/Super-8 @ 2K resolution

We output: DPX (1 DPX image per frame) as our archive master, a 2K ProRes for our production copy, and a lower res .mp4 for our viewing copy

AV Capture

Recommendations

We recommend researching the standards and learning how to adapt them to your workflow. Documenting the process and training your operators is key.

Learn from the community by following blogs, twitter feeds & conferences

@CHLThor

http://preservationmatters.blogspot.com/

http://blogs.loc.gov/digitalpreservation/

Q & A

Thank You.

View our catalog @
churchhistorycatalog.lds.org

THE CHURCH OF

JESUS CHRIST

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