

# Before the Restoration

Reto Kromer • AV Preservation by reto.ch

**Restoration of Film Heritage**  
Ljubljana, Slovenia, 2017–04–12

1

# Table of Contents

- principles
- preparation
- digitisation
- conservation

2

# Principles

3

# An Ounce of Ethics

- The probability that a work is available in its integrity in the future is increased.
- All the options that existed before taking an action remain open after the action.
- Every step is carefully documented.

4

## Conservation

Conservation encompasses all activities for the care of an object, which delay its further decay and ensure that it remains in the most intact condition for the future.

5

## Restoration

Restoration includes all interventions and treatments that serve to retrieve a certain historical state and contribute to the legibility, aesthetic integrity or reuse of an object.

Restorative actions may be irreversible and require great care in planning, justification, execution and documentation.

6

## Live in the real world!

There is only one efficient way:

- keep the sources
- more prevention:
  - better insulation
  - more efficient air conditioning
- less handling of the sources
- make access copies

7

## File Formats

- The archive must be able to handle the file formats it holds.
- open source
- simple to use and well documented
- widely used by the community

8

## Different Purposes

archive master format:

→ for preservation

mezzanine format:

→ for professional use in postproduction

dissemination formats:

→ for widely spreading and easy access

9

## Preparation

10

## Film

- film as document or work of art
- elements of the film
- actual reel

11

## Sources

- splices repair
- perforation repair
- film cleaning
- chemical treatments
- ... and beyond

12

## Splices

- cement
- tape
- re-splicing

13

## Perforation

- tape bridges
- film bridges
- acetone
- notches
- V-cuts

14

## Cleaning

- PTR

● manual cleaning	● dry
● machine cleaning	● using a solvent

- re-washing

15

## Chemical Treatments

- drying
- humidifying
- mould fungus
- swelling the emulsion
- re-development
- hardening the gelatine

16

## Beyond

- transfer the emulsion onto a new base
- keep only the emulsion

17



18

## Scanner

- film transport
- light source
- camera
- image section
- wet scanning
- file format

19

## Film Transport

- sprocket
- PTR
- tension
- film path, guide and gate
- reels

20

## Light Source

- |           |            |
|-----------|------------|
| ● diffuse | ● white    |
| ● direct  | ● coloured |
- illuminant

21

## Camera

- image sensor
- resolution
- bit-depth

22

## Image Section

- camera
- projector
- safe area
- over-scan
- edge to edge

23

## Wet Scanning

- wet transfer
- full immersion
- pre-wet
- solvent

24

Data is anything  
but «raw».

25

## File Format

single image:

- DPX
- TIFF
- JPEG 2000
- OpenEXR

stream:

- Y'C<sub>B</sub>C<sub>R</sub> 10-bit  
uncompressed
- FFV1

26

## What is inside my DPX?

- log neg encoding
- log RGB encoding, quasi-log encoding
- gamma encoding, power function encoding
- scene-linear encoding

27



28

# Conservation

29

## Source

- de-restoration
- cleaning
- preparation

30

## Documentation

- [...]

31

## AV Preservation by reto.ch

chemin du Suchet 5  
1024 Écublens  
Switzerland

Web: reto.ch  
Twitter: @retoch  
Email: info@reto.ch



32