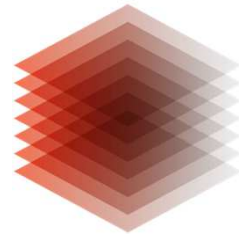


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TIB

Project DELFT Digitizing Ethnological Films - an Expedition from Analogue to Digital

Miriam Reiche

No Time to Wait Conference, October 25-26, 2018

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DELFT: The Film Collection

Institut **ML2** for Scientific Film IWF



- 11.500 film titles
- 33.000 film copies
- One of the world's largest collections of scientific films

Diapositive 2

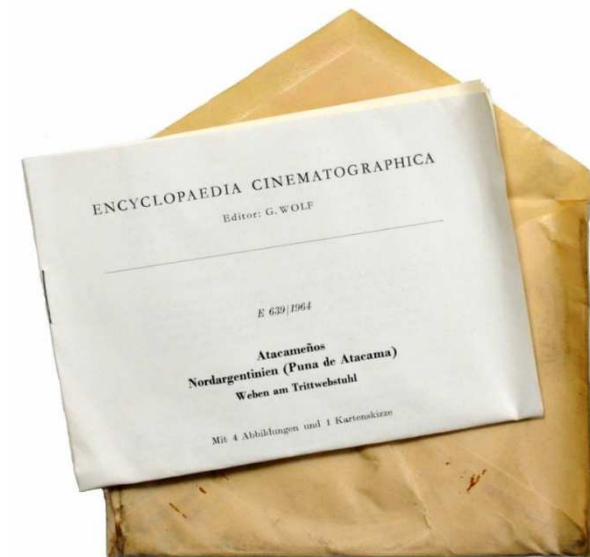
ML2

Institute

Team TIB; 23/10/2018

DELFT: The Ethnological Films of the Encyclopaedia Cinematographica

- Founded in 1952 by Gotthard Wolf
- Natural Sciences, Technology, Life Science, Medicine, Cultural Studies, Psychology



DELFT: The Ethnological Films of the Encyclopaedia Cinematographica



DELFT: Film Stock



- 16mm Film copies (film base celluloseacetat, safetyfilm)
- black and white, colour
- silent films
- films with optical tracks
- SEP-MAG, magnetic tape
- asynchronous audiotapes
- Digital Betacam
- additional material

DELFT: Project Goals



- Project Duration: October 2017-September 2019
- Digitization of ca. 2000 film titles, approx. 500 hours of film
- Cataloguing of the films
- Making the films available via TIB's AV-Portal
- Clarification of legal rights
- Digital Object Identifier DOI for each film
- Digital preservation

DELFT: Process

- Step 1: Selection of the film copy
- Step 2: Choosing target format
- Step 3: Digitizing
- Step 4: Quality control
- Step 5: Digital preservation

Step 1: Film Copy Selection

Each digitizing project starts with the selection and description of the analogue object!



- Filminspecter RTI Pulsar
- Selection of the film copy
- Recording data for each film:
 - Copy
 - Mechanical damage
 - Vinegar
 - Shrinkage
 - Colorfading

Step 2: Target Formats 16mm Film

Original Format:

16mm Films positive black/white or color

- Resolution: 2K
- Sampling rate 10 bit
- Color model and subsampling RGB 4:4:4
- Frame rate: comparable to the original (16/18/24FPS)
- Overscan

Target Format

- Container: Matroska (.mkv)
- VideoCodec: ffv1, Version 3 (GOP of 1, 16 Slices, CRC-Checksums per Slice)
- Audio-Codec: linear PCM 96 kHz / 24 bit

Derivative Copy

- Container: MPEG-4
- Video Codec: H.264, CRF 20
- Compression to 65%
- original scanning resolution without scaling
- 4:3 aspect ratio
- Audio Codec: AAC

Step 2: Target Formats Digital Betacam

Original format: Digital Betacam black/white or color

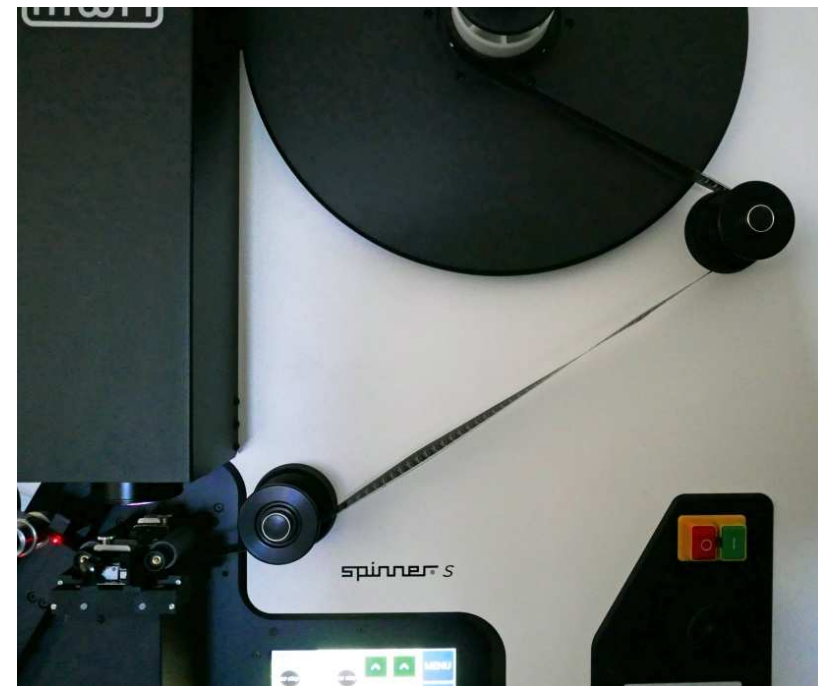
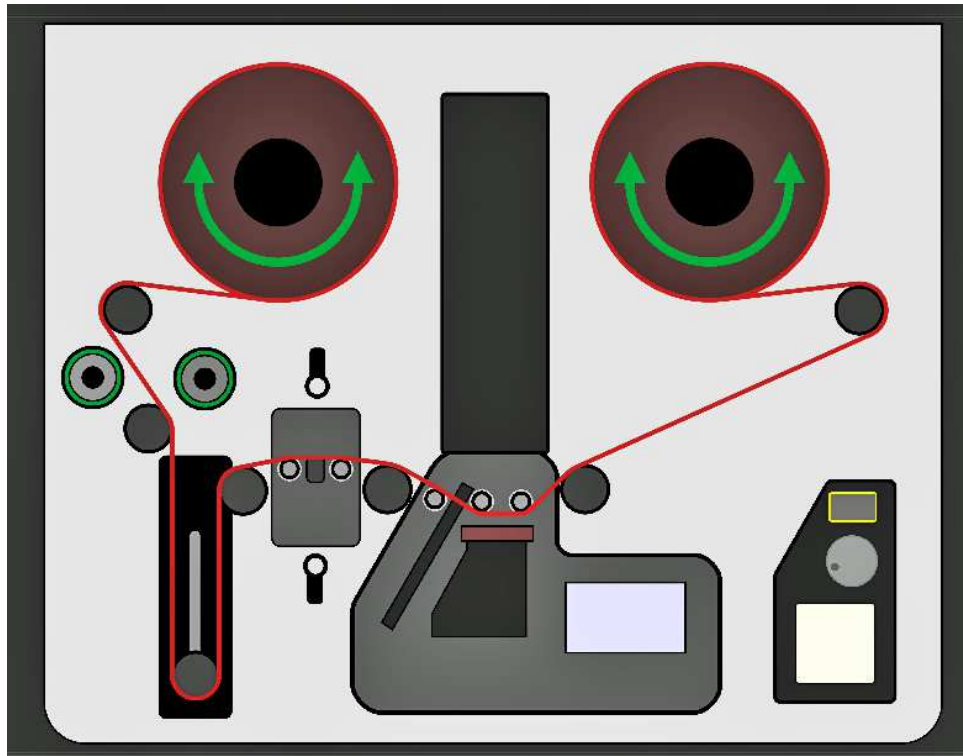
- Resolution: 720 x 576 Pixel
- Framerate comparable to the original
- Quantization/Bit: 10 bit
- Color Space: Y'CBCR
- Subsampling: 4:2:2
- Master Interlaced
- Derivative Progressive

Step 3: Digitizing



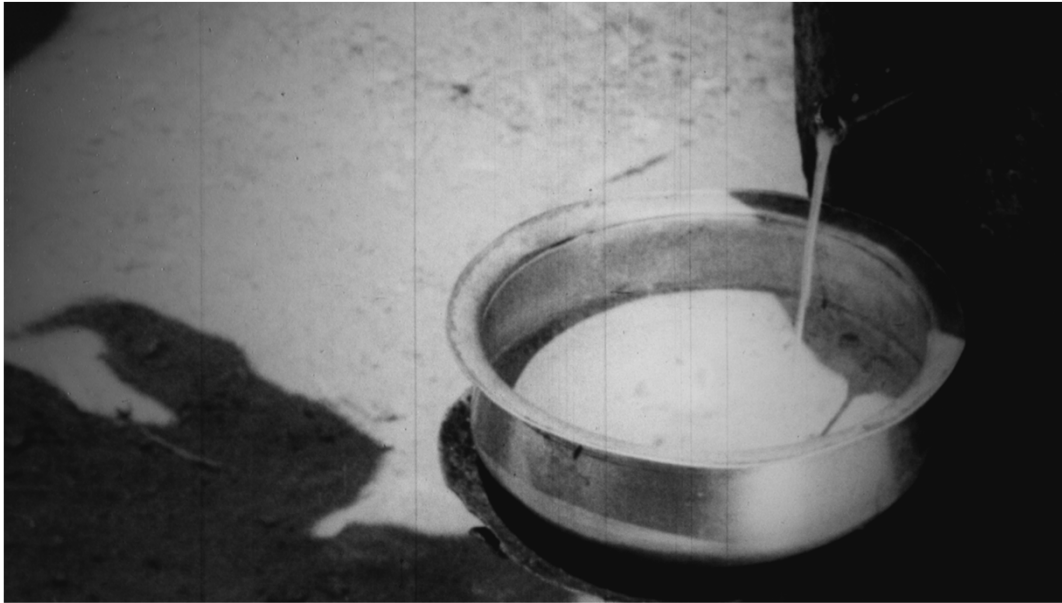
Scanner: MWA Nova Spinner S

- sprocketless and capstanless motion transport
- unlimited shrinkage, warped film
- large rollers for reduced stress on splices or brittle film
- stable filmtransport



Warped film in the scanner

Step 3: Digitizing



The scanner's diffuse light source reduces the effects of mechanical damage such as scratches etc.

Step 4: Quality Control

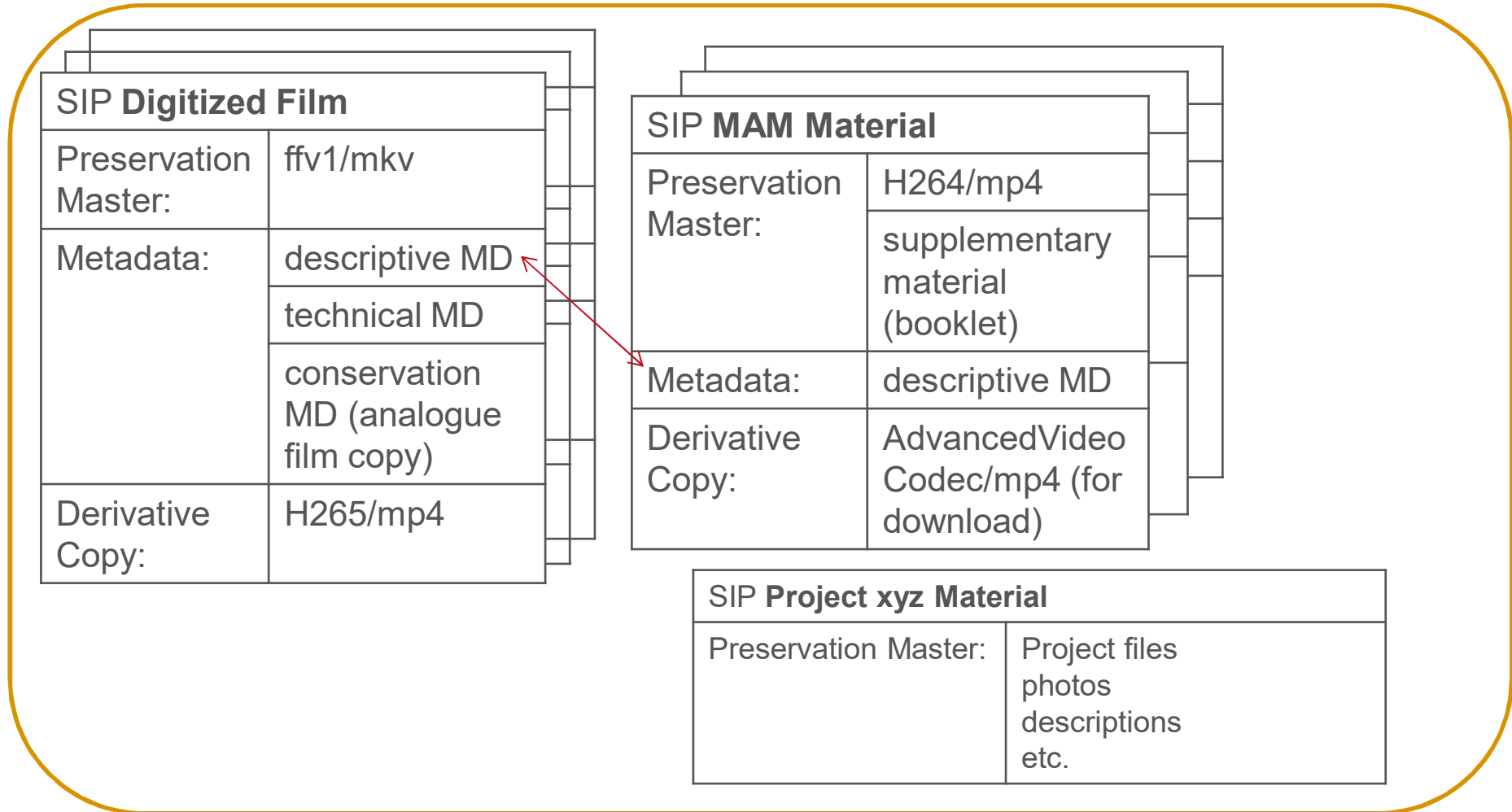
→ 7 hours Film per Week → 2TB SSD Harddrive

- Archival master ffv1/mkv
 - Derivative copy H.264/mp4 and H.265/mp4
 - Checksums framemd5
 - Technical metadata
-
1. Correct name of the file
 2. Content completeness: film title, film duration
 3. Image quality (artifacts etc.)
 4. Playability of the master
 5. File format validation
 6. Policy alignment
 7. Checksum check

Step 5 Digital Preservation

AV Material in the Digital Archive

Collection: Projectnumber xyz (x films)



DELFT Experiences: Quality ...an example: Digitizing 2007

1. Source material: 16mm - but which copy?
2. Resolution: SD and HD - but which film in which resolution?
3. Retouching, color correction - no documentation!

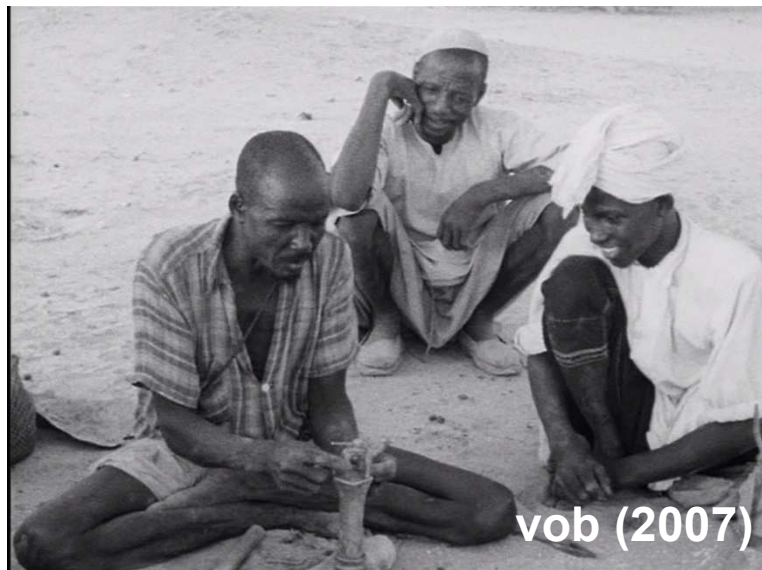
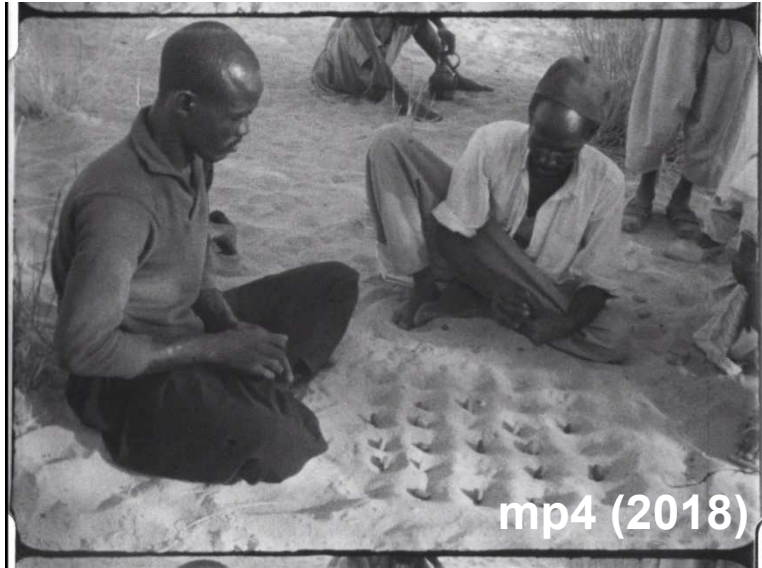
→ The digitization took place 20 years ago and we already have loss of information!

DELFT Experiences: Definition of quality



1. Sustainability in the choice of digitization parameters
2. Collecting of standardized metadata
3. Documentation of the source material
4. Preservation of the originals
5. Retaining the authenticity of the original material

DELFT Experiences: Retaining the authenticity of the original



DELFT Experiences

Know your stuff !

The potential of a digital representation lies in the materiality of the analogue object; the technical possibilities help to transfer this potential.



DELFT Experiences



Additional materials contextualize the film!

Regionale Reihenfolge

	Min.	S/N	
E 1209 Tubu (Ostsahara, Tibesti) Herstellen eines Beils	9	x	
E 1210 Tubu (Ostsahara, Tibesti) Errichten und Abbrechen eines Zeltes	21	x	x
W 770 Ostsahara, Tibesti) Satteln und Beladen eines Kamels bei den Tubu	4 1/2		x
E 1211 Tubu (Ostsahara, Tibesti) Sandorakel	2 1/2	x	x

ABNAHMEPROTOKOLL Veröffentlichungsnummer **E 1347**

Vorhaben 920 Sachbearbeiter Frl. Andréa M.A. Tag der Vorführung 19. Dez. 1967

Titel Tubu
Ostsahara - Tibesti
Spiel sagrae

Länge 56 m / 16 mm - schwarz-weiß / Tonspur / Tonc- Vorführungsgeschwindigkeit 24 B/s
Vorgeführte Kopie (Bild/Ton) S/W - Schnittkopie 16 mm

Ergebnis Abgenommen.

Veröffentlichung als Film

Protokoll: K. Fiedler (Inhaltsdirektor) Gelson (Abteilungsleiter) Andréa (Sachbearbeiter)

Telegramm Deutsche Bundespost

aus 2178 FORTLANY ZCZC 29 16 1 1304 =

13 E 1353 (Zugabe) Freit

7 E 1361 Kei Tr

2 E 1362 Kei Tr

FORSCHUNGSFILM
GOETTINGEN/ALLENAGNE =

113 1633
5833

113 1633
5833

2. MRZ. 1965

42 B PARIS F

Bereits zugesprochen

ERWARTEN INSTITUTSTEAM WIE VORGESEHEN ACHTEN MAERZ =
PETER FUCHS +
Fr. Andréa
2 E.A.

COL FORSCHUNGSFILM ERWARTEN INSTITUTSTEAM

Dienliche Rückfragen

Schürsteche, Hannover 35 150 Blöcke zu 100 Bl. 7. 81

© 197, DIN A 5
10,2 cm x 7,4 cm

Institut für den Inhaltsangabe über die Kamera- und Tonnausrüstung für
Göteborg, Film 920 "Madjerai" (Expedition in die Republik Tschad/
Fort Lamy)

Tonkoffer Nr. 1: Maße: 86 x 45 x 37 cm, Gewicht: 51 kg, Wert: 1330,-- DM
32 Spulen à 360 m LER BASF (18 cm) Tonband in Kunststoffkassetten
9 Kunststoffkassetten m. 18-cm-Leerspulen
11 St. 4 540 m PES BASF (13 cm) Tonband in Kunststoffkassetten
4 St. 15-cm-Leerspulen in Kunststoffkassetten
9 St. 15-cm-Leerspulen in Normalkassetten
3 St. Mikrophonkabel für MD- und K-Mikrofonen
5 St. Pilotkabel f. Artiflex- und K-Mikrofone

Koffer Nr. 2: Maße: 87 x 37 x 28 cm, Gewicht: 23,4 kg, Wert: DM 500,--
E St. Akkus
4 St. 400-watt-Sprecher-Apparate GENERAL Nr. 1344, 1359, DM 300,--
4 St. 1561, 1562 " 130,--
3 St. Kopfhörer dazu " 100,-- DM 550,--
4 Kabelmikrofon dazu
3 Kabelmikrofonen m. Mikrofonverl. Kabeln
1 Pl. Spirals, Lassoaband (Verbr. Mat.)
8 St. Schweißkohlenstoff

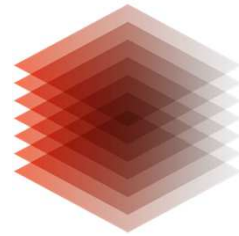
Tonkoffer Nr. 4: Maße: 56 x 64 x 28 cm, Gewicht: 30 kg, Wert: DM 2400,--
2 Drahtlose Mikrofon-Anlagen mit
2 Kleinsendern Nr. 10237 und 10518 und
2 Reserve-Akkus 63058 und 63056 und
2 Ladegeräte
2 Anschließkabel
Versch. Batterien (Verbr. Mat.)
2 Windschutz f. MD 211-Mikrofon

Koffer Nr. 5: Maße: 87 x 37 x 28 cm, Gewicht: 29 kg, Wert: DM 6000,--
3920 m Ektachrome Commercial 16 mm Rohfilm
3600 m Kodak Double X/16 mm Rohfilm
840 m Ektachrome Commercial 16 mm Rohfilm

Koffer Nr. 6: Maße: 87 x 37 x 28 cm, Gewicht: 32,6 kg, Wert: DM 5000,--
1 Lassoaband (Verbrauchsmaterial)
6 St. Sun Gun-Akkus
6 St. " -Ladekabel
4 St. " -Verlängerungskabel
1 St. Eisemann-Ladegerät PFG 6/6 - 12/5 W 220/1

Wert: DM 11000,--

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MORE INFORMATION:

www.tib.eu

TIB Digital Preservation:

<https://www.tib.eu/de/publizieren-archivieren/digitale-langzeitarchivierung/>

Project DELFT:

<https://projects.tib.eu/delft/>

Contact

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