



**Definition of scanning properties and recommendations for
photographing musical instruments version 1
D1.1**

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0. Advertisement

In its present form, this document is organised in a way to take as less printing space as possible and to give a compact overview. For everyday use it is recommended not to print it out but use it in electronic form in order to employ full text search functions to find instrument names. This text will be further developed and refined during the project's lifetime, among other things by the list of instrument names (WP3) and the practical experiences furnished by all stakeholders during the digitising process. Care was taken to use images from the consortium's institutions. However, this was not always possible in the present state of the project. This version of the standard paper is thus strictly internal and not for public use.

1. General considerations on standards

Some definitions on standards:

- „A technical standard is an established norm or requirement. It is usually a formal document that establishes uniform engineering or technical criteria, methods, processes and practices.“ (Wikipedia)
- „A *de facto* standard is a custom, convention, product, or system that has achieved a dominant position by public acceptance or market forces.“ (Wikipedia)
- „In social science, a *de facto* standard is a usual solution to a coordination problem. The choice of a *de facto* standard is the better choice for situations in which all parties can realize mutual gains, but only by making mutually consistent decisions.“ (Wikipedia)

A standard in the frame of the MIMO-project is thus an agreement by concerned parties – the project partners – and will be based on as large a number as possible of *de facto* standards.

2. Scope

This standard text concerns in its photography part overall views of musical instruments, but no images of details. It distinguishes several levels of obligation:

- mandatory
- recommended
- optional

The *mandatory* and *recommended* views together describe a sufficient optical representation of a musical instrument according to the customs of experienced specialists as museum curators. The mandatory view describes the view to be taken if one and only one view can be taken or shown, e.g. the plan view of the front of a violin.

Recommended views describe supplementary views necessary for full first information about the instrument and which can be taken with very few supplementary means once the mandatory view is taken, e.g. the plan view of the back and of the side of a violin.

Recommended views are regularly given in this standard, if existent as *de facto* standards.

Optional views are views which either are made for public relation purposes, e.g. the $\frac{3}{4}$ view of a violin, or which request important supplementary means once the mandatory view is taken, e.g. the bird's-eye view on a piano.

Detailed advice on lighting, fixing of instruments and other technical issues are not in the scope of this standard, but they will be collected as hints to create a pool of practical expertise to make photography more efficient and as safe as possible for the museum objects.

This standard applies to all new photographs taken by consortium members as well as associated project members. In its final version it is intended to be a recommendation for documentary photography for all musical instrument collections. It does not concern photographs taken for artistic or public relation photography etc.

3. Master files, derivatives and digital preservation

A *master file* is the electronic document which has the best quality and serves for a collection's documentation. Once it is created, it shall not be altered and is subject to long-time preservation according to actual best practice. An important part of long-time preservation is the proper naming and saving of the file metadata in order to find it back at any time.

A *derivate* is a copy of the master file which is altered to make it suitable for a special purpose, e.g. low-resolution images and cut-down sound files for web-publishing. Camera metadata shall be kept within the files.

4. Web output formats (formats for derivates)

Images:

- JPEG
- 24bit colour / 8 or 16bit greyscale
- Length of the longest side of the image: 800 pixels

Sounds:

- mp3 format
- 128 kB/s bit rate
- up to 30 s length (up to ca. +-120 s if IPR permit)
- stakeholders have to clear IPR issues according to legislation in their countries
- output level normalized

Video:

- Due to the actual technical development, this issue is reported to a later version

5. Quality control

In digitisation processes, an efficient quality control routine must be implanted. Quality control should happen during or very close to the digitising process in order to repeat processes with a minimum amount of work and time, if necessary. Parameters and procedures of quality control should be clearly determined.

6. Parameters for scanning existing images

Slides, b/w-negatives, glass negatives etc. shall be scanned in such a way that the master file format of the scan corresponds roughly to A4 (297x210 mm) or larger in minimum 300 dpi resolution. Prints shall be scanned in a way to obtain a master file which gives a print-out format of the size of the original document at 300 dpi. The colour format is 24 bit for colour images and minimum 8 bit for greyscale images. The recommended file format is uncompressed TIFF. ICC-profiles shall be included.

7. Parameters for digitising analogical sound data

The master file format of the digitised file should at least correspond to so-called Compact-Disc-Quality with a sampling rate of 44.100 Hz, stereo and 24 bit resolution. For archival use, the output file format must be lossless, i.e. for example WAV or AIFF. If an analogical source is in mono, care should be taken to provide both stereo channels with the signal. For further use it is recommended to digitise the entire analogical audio source at a time and cut short examples for derivates separately. Samples should be cut in a senseful and aesthetic way, i.e. phrases should be searched which make as much musical sense as possible, and cuts should be made soft, e.g. faded in resp. out.

8. Parameters for digitising analogical video data

Due to the actual technical development, this issue is reported to a later version.

9. Photographing musical instruments

9.1. General considerations

9.1.1. Technical quality

The quality of the master file is 24bit colour at a minimum size of ca. 2.100 pixels for the longer side, corresponding to ca. 17,8 cm at 300 dpi. However, due to technical development, a larger size is recommended. The file format must be lossless, e.g. uncompressed TIFF. The ICC profile should be included. Precautions for a professional colour management shall be taken.¹

9.1.2. Lighting, background and mounting

Lighting should be such that no important part of the instrument is obscured by shadows. The colour and structures of the materials should be rendered as clearly and naturally as possible. In most cases, a soft lighting is the best choice. The views of instruments described in the following texts aim to show important organological details as form, proportions and technical details rather than to give a decorative aspect. In mass digitisation, care should be taken to use one lighting scenario for as many objects as possible to be efficient, e.g. for a series of reflecting instruments as brasswinds. If possible, the object should be photographed using a neutral background. The following specifications give the appearance of the instrument in a two-dimensional image. In some cases, the requested view can be obtained by different mountings, e.g. lying on a flat surface, standing upright or being suspended. In mounting instruments for photographing, conservational concerns are more important than speed or beauty.

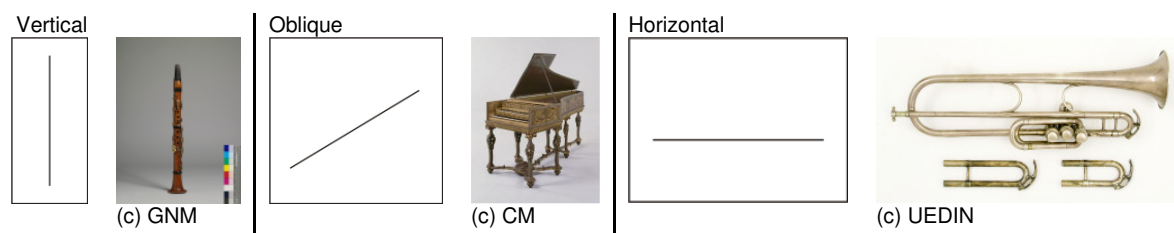
9.1.3. Distortion

Distortion by photo lenses should be minimized. It is strongly recommended to use long focal distance lenses rather than wide angle lenses, if the spatial situation permits.

9.2. Instrument groups and instruments grouped by view characteristics²

9.2.1. Definitions of positions and views

The *position* parameter does not refer to the three-dimensional orientation of the instrument in space, but to the line of its longest axis in the two-dimensional representation. Positions are:

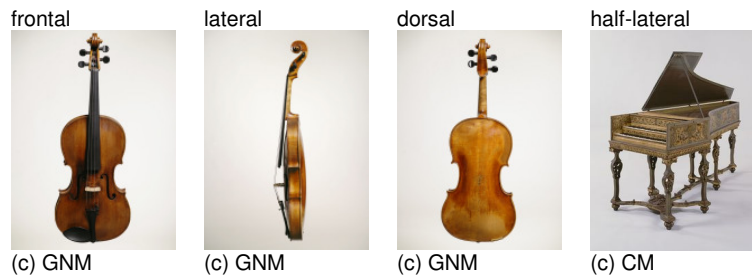


NB.: The oblique position doesn't fix a specific angle. It normally goes with a camera position more or less slightly from above. The direction bottom-left to top-right is appropriate for the most instruments and aesthetically more appreciated.

¹ e.g. in EXIF-Data, or in including a colour target in the setting.

² see 0. Advertisement in this text.

The *view* parameter depends on organological conventions and defines which side of an instrument faces the camera lens. Views are:



N.B.: The half-lateral view is a camera position anywhere between the frontal and the lateral position at an angle appropriate to the type of instrument. A possible half-lateral view with a camera position between lateral and dorsal is employed to show e.g. guitars or viola da gambas with ornamented sides and backs. This type of view is [optional].

9.3. Details for instruments and instrument groups

9.3.1. Oblique position and half lateral view

The instrument's longest axis is appearing in the photo in an oblique line from bottom left to top right. According to the details which shall be shown (e.g. keyboards), the view is more or less slightly from above. Depending on the construction of the instrument, the playing device is thus on one of the sides facing the camera. Typically, the instrument is standing or lying on a flat surface.

- wing-shaped stringed keyboard instruments, such as: pianofortes, harpsichords, tangent pianos, etc. Bent-side spinets and bent-side pianos should be positioned in a way that the keyboard appears in an oblique line from top left to bottom right. Lids should always be opened [mandatory]. A closed lid is [recommended] especially for decorated cases.



The Metropolitan Museum of Art, New York; inv.no. 89.4.2363

- Percussion idiophones, played sideways, such as: xylophones, lithophones, metalophones, vibraphones, marimbas, gambangs. The view is more or less slightly from above. In choosing the camera angle, attention should be made to show important organological details, e.g. resonators. Here, the side from which the instrument is played should be facing the camera [mandatory].



Musée de la musique, Paris; inv.no: E.998.10.1 (photo shows the right position, but wrong side; will be replaced)

- Stringed drone instruments, such as: hurdy-gurdies, organ hurdy-gurdies, nyckelharpas



Cité de la musique, Paris ; inv.no. : E.52

- Open harps, such as: arched harps, angular harps

Museum of Fine Arts, Boston; inv.no.: 17.1783



- Non trapezoid zither instruments, such as: vinas, kanteles, pedal dulcimers, aliquodiums, struck zithers, descant zithers, kratzzithers, bowed zithers, bowed melodions, resonance zithers, double and triple zithers, epinettes des vosges, psalmodicons, double psalmodicons, transverse zithers, autoharps, zithers without fingerboards, harp zithers, arpanetti, horn zithers, kotos, qanuns, santurs, cimbaloms, raft zithers, Salzburg zithers, Mittenwald zithers, Concert zithers

Museum of Fine Arts, Boston; inv.no.: 1989.131



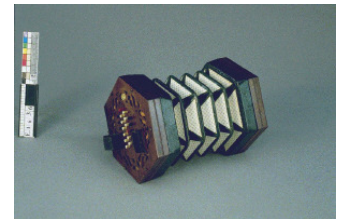
- Harmonicas, harmonichords

The Stockholm Music Museum, Stockholm; inv.no.: N149324



- Accordions, such as: bandoneons, concertinas, aeolas, hand-aeolines. The instrument should be positioned so that the treble keyboard is visible. Instruments with large bellows can be photographed frontally, the bellow opened in a U-shaped manner, so that both playing sides are visible. Instruments with protruding descant keyboard can be photographed frontally.

Cité de la Musique, Paris; inv.no.: E.1636



- Regals

The Metropolitan Museum of Art, New York; inv.no.: 89.4.2883



- Sansas

Royal Museum for Central Africa, Tervuren



- Shell horns. These are appearing in an oblique line in the photo, but the view is variable, according to the instrument's form and special features.

Museum of Fine Arts, Boston; inv.no.: 17.1977



- Slit drums in non-anthropomorphical shape.



Museum of Fine Arts, Boston; inv.no.: 17.2128a-b

- Drum instruments (except shallow frame drums), if playing position clearly suggest a horizontal position, that one membrane is visible [mandatory], a photo with the other membrane is [recommended].
- Keyed monochords

9.3.2. Horizontal position and frontal view

The instrument's longest axis is appearing in the photo in a horizontal line. The camera faces the side of the instrument which is commonly considered as front side and sees the instrument slightly from above. Generally, the instrument is standing or lying on a flat surface.

- transverse flutes, such as tabor-pipes, nose flutes, flauto d'amores, piccolos, boehm flutes, reform flutes, csakans, albisifonos, didses, cane transverse flutes
The main tone holes are always facing the camera frontally.



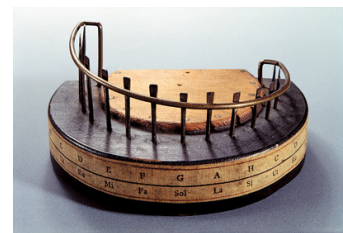
The Metropolitan Museum of Art, New York; inv.no.: 89.4.2057

- rectangular or polygonal stringed instruments, such as: orphicas, spinets, clavichords, square pianos, physharmonicas, virginals, double virginals, work box pianos, terpodions, automatic spinets, eolodicons, nail pianos, trapezoid and triangular zither instruments. If there is a keyboard, it is always facing the camera in a horizontal line. The lid should always be opened. [mandatory]. A closed lid is [recommended].



The Stockholm Music Museum, Stockholm; inv.no.: M2592

- Nail violins



Stiftung Händel-Haus, Halle

- Glass-harmonicas, verrillions



Österreichisches Musiklexikon Online

- Consistent sets of instruments, like gamelans, drum sets etc. disposed in playing setup, photographed from an audience view.

9.3.3. Horizontal position and lateral view

The instrument is appearing in a horizontal position. The picture angle is lateral and can be, according to the instrument's attributes, obliquely from above. For brasswind-instruments, "lateral" means a view on the coil(s) or curves so that their form can be distinguished, independently from what the actual playing position is (e.g. trumpets with perinet valves vs. trumpets with rotating valves). The side facing the camera is the one providing the larger amount of organological information (e.g. valves, triggers). If there is no evidence for such a side, the instrument's bell is on the right side.

- brass instruments whose bells are not directed upwards while playing them, such as: keyed trumpets, keyed horns, flugel horns, cornets, military bugles, clavicons, French horns, kuhlo-horns, helicons, vertical trumpets, natural horns, natural trumpets, fanfare horns, hunting horns, invention trumpets, aida trumpets, trumpet bugles, glass trumpets, orchester horns, cupid's horns, fog horns, cornophones, invention horns, harmonicators, Russian horns, posthorns, slide trumpets, Büchel.



Cité de la musique, Paris ; inv.no. : E.0831

- French horns, parforce horns, horns with circular coils except posthorns: The blowpipe is on a horizontal line, the side containing the more important organological information is facing the camera.
- Posthorns: The coil is oriented downwards, blowpipe and bell pointing symmetrically upwards.
- Curved horns without coils, such as: alphorns, hunting horns, oliphants, transverse horns, crescents, shepherd's horns. The camera is at a right angle with the curve. For side-blown horns, it is more important to show clearly the mouthpiece than the curve at a right angle.



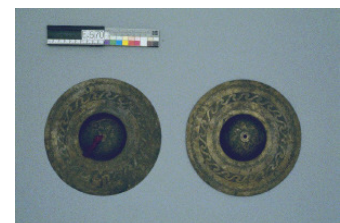
Museum of Fine Arts, Boston; inv.no.: 57.581

- Trombones: Assembled with the slide and bell bows at right-angles; photographed at 45 degrees to both, the camera positioned above a point between the two slide stays.



University of Edinburgh; inv.no.: EUCHMI (4108)

- Concussion idiophones like clappers, cymbals etc.: The camera sees the objects from above at a right angle, showing the more important side resp. sides. For a pair of cymbals, one can show the hollow side, the other the dome.



Musée de la Musique, Paris; inv.no.: E.570

- Castanets. The instrument is lying and the cord, if still preserved, is at the top of the photo. Both shells are slightly overlapping. The photo is taken from the bird's eye perspective. One pair of shells can be opened.



The Metropolitan Museum of Art, New York; inv.no.: 2005.421a-c

- Mouth-bows. The curved side is oriented to the bottom.

9.3.4. Horizontal position and dorsal view

- Jew's harps, such as: finger activated jew's harps, string activated jew's harps. The instrument is appearing in the photo in a horizontal position. The end where the tongue is fixed is located on the right side of the image. The view is obliquely from above.

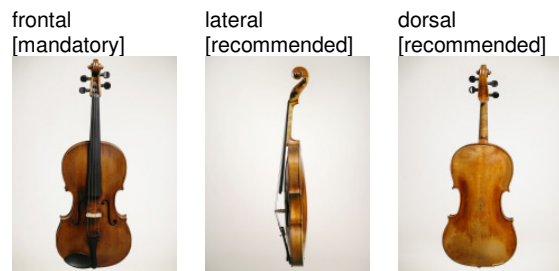


Horniman Museum, London; inv.no.: 2004.569

9.3.5. Vertical position and frontal view

The instrument's longest axis is appearing in the photo in a vertical position. The camera faces the side of the instrument which is commonly considered as front side. The instrument is standing or lying on a flat surface. Usually, the photo is taken from a central perspective.

- lute and violin instruments, such as: renaissance lutes, theorbos, cobzas, mandolins, torbanas, mandoras, saz, tamburas, citterns, esrars, bent neck lutes, chitarrones, san xian, yue gins, bracs, tars, gitterns, angelicas, pandurinas, Swedish lutes, bass citterns, key citterns, tanburs, rebabs, sarangis, descant lutes, colasciontinos, lyra citterns, harp citterns, ukuleles, banjos, trumscheits, bandurrias, balalaikas, bowed mandolas, arpeggiones, lira da braccios, sultanas, contraltos, lyras, crwth, rottas, kissars, rebecs, shamisens, bandolons, biwas, sitars, domras, pipas, tanburs, tars, uds, feles, accord guitars, flamenco guitars, double neck guitars, concert guitars, western guitars, bass guitars, guitars with freerunning bass strings, twin-neck guitars, violins, violas, cellos, contrabasses, small basses, kits, cane violins, philomeles, silent violins, travel violins, viola da gambas, viola d'amores, klarfideln, bumbasses, lyra guitars, gusles, pochettes, bassoon violins, spike fiddles, er hu, Thuringian Forest zither. The instrument is appearing in a vertical position. Therefore, a suspension of the particular object might be necessary. The frontal view is [mandatory]. Lateral (violin instruments facing left side) and dorsal views are [recommended]. For instruments of the violin family, the height of the camera lens should be at the level of the upper corners.



Germanisches Nationalmuseum, inv.no.: MI 945

- Struck idiophones, such as: anthropomorphical slit-drums, gongs, tam-tams, bells, triangles, mallet instruments, Turkish crescents, tubular bells, xylophones, metalophones and lithophones played from the bass end, as straw fiddles.



Cité de la Musique, Paris; inv.no.: E.2000.11.1

- Upright stringed keyboard instruments, such as: giraffe pianos, pyramid pianos, harp pianos, pianinos, clavicytheriums. The keyboard is facing the camera.



The Stockholm Music Museum, Stockholm; inv.no.: M466

- Organs, such as: procession organs, positive organs, chamber organs, harmoniums, harmonicons, hydraulic organs, portative organs. The keyboard is facing the camera.



The Stockholm Music Museum, Stockholm; inv.no.: X5575

Straight-form³ reed instruments, such as: clarinets, oboes, bassoons, shawms, pommers, windcap shawms, musettes, zurnas, contrabassophones, dulcians, sorduns, cane bassett horns, oboe d'amores, tarogatos, sarrusophones, English horns, clarinet d'amores, straight bassett horns, contrabassoons in bassoon-like shape, racketts, algaitas, mayhorns, hichirikis, sonas, heckelclarinas, heckelphones, schryaris, melodions, chalumeaus, auloi. The frontal view is [mandatory], while for some types of instruments – e.g. bassons, clarinets – a dorsal view is [recommended].

frontal
[mandatory]



dorsal
[recommended]



Germanisches Nationalmuseum, inv.no. MIJ 30

³ „Straight-form“ is employed to distinguish appearance from construction. E.g., a bassoon is in “straight-form”, but its tube is not straight, but folded.

- Cornettos, such as: mute cornettos, curved cornettos



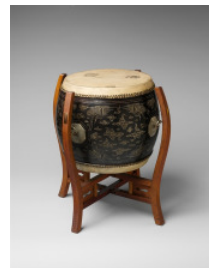
Museum of Fine Arts, Boston; inv.no.: 17.1949

- Longitudinal flutes, such as: multiple flutes, panpipes, recorders, flageolets, cane flutes, dvojnices, bassanellos, csakans, shakuhachis, tabor-pipes, bone flutes, giorgi flutes, nays



Germanisches Nationalmuseum, Nuremberg; inv.no.: MIR230

- Drum instruments (except shallow frame drums), if playing position not clearly suggest a horizontal position, such as: cylindrical drums, conical drums, barrel drums, hour glass drums, cup-shaped drums, foot drums, vessel drums, friction drums, kettledrums, side drums, lansquenet drums, daikos, tsuzumis, tablas. The drum is standing upright on one of the two membranes resp. the bottom of the body. The camera position is obliquely from above, so that both the body and one membrane are clearly visible.



The Metropolitan Museum of Art, New York; inv.no.: 89.4.28 a,b

- Friction drums as rommelpots etc. The view is obliquely from above, so that both the body and the membrane with the friction stick are clearly visible.



The Metropolitan Museum of Art, New York; inv.no.: 2006.96

- Serpents



Horniman Museum, London; inv.no.: 14.5.47/145

- Cane- resp. walking-stick instruments



Museum of Fine Arts, Boston; inv.no.: 17.1864

9.3.6. Vertical position and half lateral view

In the photo, the instrument is appearing in a vertical position. For a better understanding of the object's special formal characteristics, the view is half-lateral, which means that two sides are visible.

- Curved woodwind instruments, such as: bass clarinets, bass oboes, saxophones, crumhorns, contrabassoons with several windings, pibcorns, tenor cornettos. The instrument is placed in a way, that the mouthpiece is in the top right of the photo and the bell is in the bottom left.



Cité de la musique, Paris ; inv.no. : E.2002.11.6

- Small, mostly rectangular programme music instruments, such as: organ clocks, bird organs, saloon barrel organs, music boxes, organettes, humming tops. If there is no side with very important organological information, the front-line of the instrument should be in the direction bottom-left to top-right.



<http://www.firedragon.com/~kap/Langshaw/>

- Frame harps, such as: hooked harps, pedal harps, pointed harps, diatonic harps, chromatic harps. The base of the harp pillar is in the bottom left and the top end of the sound box is in the upper right of the photo.



Cité de la musique, Paris ; inv.no. : E.275

- Shallow frame drums, such as: tambourines, flat drums. The view is on the mebrane obliquely from above [mandatory]. A view from the backside is [recommended], if there are important details. As for tambourines, there might be a suspension necessary.



Cité de la musique, Paris ; inv.no. : E.878

- Bagpipes, such as: zampognas, musettes, dudas, cornemuses, bocks
The bagpipe is placed in a way, that the bag and, if existing, the bellow is positioned in the middle of the image and the pipes are loosely arranged in front of or beside the bag. If possible, the pipes are in a more or less vertical position with the tone holes facing the camera.



http://www.dudelsack.at/maehrischer_dudelsack.php

9.3.7. Vertical position and lateral view

The instrument is positioned vertically on, resp. in front of a flat and neutral background and the view on the particular object is lateral.

- brass instruments whose bells are directed upwards while playing them, such as: tubas, tenor horns, ophicleides, bombardons, barytons, bass horns, saxhorns, euphoniums, lurs. The bell-end of the instrument is pointing upwards. The side facing the camera is the one providing the larger amount of organological information (e.g. valves, triggers). If there is not such a side, the instrument's coil is on the left side.



Horniman Museum, London; inv.no.: 2004.1169

- mouth organs, such as: shengs. The instrument is standing on the bottom of the calabash. In the photo, the mouthpiece is on the right side.



The Metropolitan Museum of Art, New York; inv.no.: 89.4.2894

- musical bows hold upright as berimbaus etc. Due to the vertical position of the instrument in the photo, a suspension may be necessary. The curve of the bow is directed to the right side of the image.



<http://www.berimbau.info>

9.3.8. Special positions and views

9.3.8.1. Vessel flutes and animal voice imitating devices

- Cuckoos, duck pipes etc.; vessel flutes, such as ocarinas. The position of the particular instrument as well as the view on it, is depending both on form characteristics of the object and on details which should be shown. In most cases, the picture angle is from above. The surface, on which the instrument is lying or standing, should be flat and neutral.



The Metropolitan Museum of Art, New York; inv.no.: 1984.507.9

9.3.8.2. Different idiophones

- Concussion idiophones, shaken idiophones, scraped idiophones, such as: rattles, stamping sticks, scrape vessels, bull-roarers, ratches, clappers. The position of the instrument is depending on form characteristics and special details of the object. Where it makes sense, standard positions and views will be developed during the photographing tasks and continuously integrated in this text.



Royal Museum for Central Africa, Tervuren

9.3.8.3. Objects in bad condition

- Many objects in bad condition or with partial losses are nevertheless important sources for information about the development and variety of musical instruments. If the instrument is broken in several parts, the parts in the photo should be arranged in a way that the image gives an idea of its original shape and construction. As for this group of instruments and for technical reasons, it is not always possible to apply the definitions of view and positions in this document, these definitions may in this case be suspended.