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**MIMO**

# **Definition Of Scanning Properties And Recommendations For Photographing Musical Instruments**

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<sup>1</sup> OJ L 79, 24.3.2005, p. 1.

Based on partners' further practical work in digitising musical instruments and in application of version 2 of this paper (D1.5), feedback, MIMO-born images and practical hints were continuously collected by WP1 lead (GNM) in order to prepare the final version 3 of the standard paper.

An external evaluation conducted by WP5 among members of ICOM-CIMCIM led to improvements in form and content.

The attached document shall be made public as soon as the English wording will be checked by a native speaker and will be delivered as final version of Deliverable D1.8.

Attached document: *The MIMO digitization standard. Definition Of Scanning Properties And Recommendations For Photographing Musical Instruments - final Version 3 (draft)*

# The MIMO Digitisation Standard

Definition of scanning properties  
and recommendations for photographing  
musical instruments

final version 3  
- draft -

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for

**MIMO**  
musical instrument museums online

Nürnberg, 2011

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## 0. Introduction

This paper is one of the outcomes of the European Community funded digitisation project MIMO – Musical Instrument Museums Online. It is largely based on practical experience of all the members of a consortium of eleven major musical instrument museums and collections in Europe. The authors want to thank all the partners who contributed by images, remarks and sharing of practical hints:

University of Edinburgh (UEDIN), Edinburgh, UK  
Coordinator (WP4 – lead), Content Provider

Germanisches Nationalmuseum (GNM), Nuremberg, DE  
Digitisation (WP1 – lead), Content Provider

Cité de la Musique (CM), Paris, FR  
Harvesting (WP2 – lead), Content Provider

Horniman Museum (HML), London, UK  
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Content Provider

Associazione "Amici del Museo degli Strumenti Musicali" (AF), Florence, IT  
Content Provider

Università degli Studi di Firenze (UF), Florence, IT  
Thesaurus and Classification

This final version was developed over the two years' lifetime of the project from 1. September 2009 to 31. August 2011 and has undergone permanent evaluation by the consortium as well as by external experts through members of CIMCIM – Comité international des musées et collections d'instruments de musique – a worldwide committee of the International Council of Museums ICOM. The authors are indebted to these specialists having studied the paper's evaluation version and commented on it.

A special thank goes to Prof. Arnold Myers, University of Edinburgh helping the authors in checking the English wording.

## 1. General considerations on standards

To better situate this paper in the realm of museum policies, some common definitions on standards are given:

- „A technical standard is an established norm or requirement about technical systems. It is usually a formal document that establishes uniform engineering or technical criteria, methods, processes and practices.“<sup>2</sup>
- „A *de facto* standard is a custom, convention, product, or system that has achieved a dominant position by public acceptance or market forces.“<sup>3</sup>
- „In social sciences, a voluntary standard that is also a *de facto* standard, is a typical 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.“<sup>4</sup>

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 – except for instruments of the violin family – 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 like museum curators, however, as stated before, without taking in account images of details.

### Mandatory view

The *mandatory* view describes the image if, for practical reasons, one and only one view can be taken or shown, e.g. the plan view of the front of a violin. In choosing this view, a public as large as possible is taken in account, even if for some specialist purposes this view is of lesser value.

### Recommended views

<sup>2</sup> Wikipedia, „Technical standard“, 8.11.2010

<sup>3</sup> Wikipedia, „De facto standard“, 8.11.2010

<sup>4</sup> Wikipedia, „De facto standard“, 8.11.2010

*Recommended* views describe supplementary views necessary for full first information about the instrument and which mostly can be taken with very few supplementary means once the mandatory view is achieved, e.g. the plan view of the back and of the side of a violin or of a piano with half-closed lid, or the birds-eye view on the piano's soundboard. Recommended views are regularly given in this standard, if existent as *de facto* standards or proved useful by other means.

### Optional views

*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. As optional views touch the realm of artistic purposes as well, they can't be easily systematised and are thus considered as beyond the scope of this paper.

### Technical issues

Detailed advice on lighting, fixing of instruments and other technical issues are not within the scope of this standard, but they are collected as hints to create a pool of practical expertise to make photography more efficient and as safe as possible for the museum objects (see section 36).

This standard applied to all new photographs taken by MIMO consortium members as well as associated project members. This final version 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 purposes.

## 3. 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.

## 4. 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 access it at any time.

A *derivative* is a copy of the master file which is altered to make it suitable for a special pur-

pose, e.g. low-resolution images and cut-down sound files for web-publishing. Camera metadata shall be kept within the files, if suitable.

## 5. Web output formats (formats for derivatives)

Images:

- JPEG
- 24bit colour<sup>5</sup> / 8bit greyscale
- Length of the longest side of the image: 800 pixels

Audio:

- mp3 / AAC / WMA
- bit rate from 128 Kb/s
- preferably stereo
- 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:

- File format for downloading: MPEG-2; AVI; WMV; Quicktime; mp4/H264; bitrate between 300Kb/s and 2Mb/s
- File format for streaming: ASF; WMV; Quicktime; H.264 in mp4/H.264 bitrate between 300Kb/s and 1.2 Mb/s
- Frame rate of 25 frames per second
- 24-bit colour
- PAL colour encoding<sup>6</sup>

## 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 minimum. The colour format is 24 bit (3 x 8bit) for colour images and minimum 8 bit for greyscale images. The recommended file format is uncompressed TIFF. Colour profiles and suitable metadata shall be included.

## 7. Parameters for digitising analogical audio documents

The master file format of the digitised file should at least correspond to so-called Compact-Disc-Quality with a sampling rate of

<sup>5</sup> To avoid confusion: 24bit colour is 8bit red + 8bit green + 8bit blue

<sup>6</sup> These recommendations follow those made by the ATHENA project.

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 derivatives separately. Samples should be cut in a sensible 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.<sup>7</sup>

## 8. Parameters for digitising analogical video documents

The recommended master file format for short videos and sufficient storage place is RAW AVI (uncompressed). The compressed alternatives to save storage space are MPEG-1(2,4), WMF, ASF, Apple ProRes or DV with a minimum bit rate of 3 Mb / s.

The minimum size should be 720x576 pixels with a frame rate of 25 frames per second. In addition, the colour format is 24 bit using PAL as colour encoding system.

For best preservation in an open software environment, a JPEG 2000 codec in an MXF wrapper should be considered, as soon as this combination is sufficiently established and the data quantities are maniable.

Before choosing one of the above mentioned digitising methods, the provider's entire technical environment must be checked to guarantee storage, further editing and delivery facilities.<sup>8</sup>

<sup>7</sup> For all recommendations see also: IASA Technical Committee, *Guidelines on the Production and Preservation of Digital Audio Objects*, ed. by Kevin Bradley. Second edition 2009. (= Standards, Recommended Practices and Strategies, IASA-TC 04). [www.iasa-web.org/tc04/audio-preservation](http://www.iasa-web.org/tc04/audio-preservation)

<sup>8</sup> These recommendations combine those made by the ATHENA project and JISC.

## 9. Photographing

### 9.1. Technical quality

The quality of the photo 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 colour profile and suitable metadata should be included.

### 9.2. Color management

Precautions for a professional colour management shall be taken. To this purpose, a visual colour reference (target) can, but needs not to be included, e.g.:



GNM, MI 968  
Photographed together with the object (fastest)



E.2003.6.1 © Musée de la musique/Cité de la musique - Paris © Photo J.Marc Anglès.  
CM, E.2003.6.1  
Photographed under same conditions and mounted in the image (slower)



layer 1 visible  
GNM PI.O.3431  
PI.O. 3431  
both layers visible  
Two-layer Tiff (slowest, more storage space)



### 9.3. Lighting, background and mounting

Lighting should be such that no important part of the instrument is blurred by shadows or reflections. The colour and structure of the materials should be rendered as clearly and naturally as possible. In most cases, a diffuse lighting is the best point of depart. Fills, raking light to bring out surface structures, etc. belong commonly to the means of professional photographers. 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 serial digitisation, care should be taken to use one lighting and mounting scenario for as many objects as possible to be efficient, e.g. for a series of reflecting instruments as brass wind instruments. The object should be photographed using a neutral background, unless the spatial situation doesn't permit this, e.g. for organs. It is recommended to keep sufficient space around the object that can be cropped in printing. N.B.: In this paper, images are often

cropped close to the instrument in order to save space.

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.

#### 9.4. Distortion

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

#### 9.5. Post production

High-quality digital photography needs a certain amount of post-production, such as developing raw data, sharpening or colour control. Other needs for post production come from the special situation in which the instrument is photographed, especially when mounting, securing, or visible light-guiding devices were used.

Whichever measure is taken, it has to be kept in mind that the aim of documentary photography is to render images which are as close as possible to the actual perception of the object.

What is common in publicity photography, e.g. correcting shapes and surfaces, isn't in photographing museum objects.

Some considerations for a first orientation:

- Supporting devices as nylon wires or Plexiglas stands need not to be removed in post-production as long as they are clearly distinguishable from the instrument itself. If ever they are removed, retouching normally should be done around the object, not within. If e.g. the removal of a nylon wire causes a "reconstruction" of a structured surface it is better to keep the wire visible.
- Distortion by photo-lenses, especially with large objects, should be corrected to give a natural aspect.
- As long as the structure of a surface is visible, it is a matter of taste and means how much reflection a photo can contain, and sometimes reflections might be made weaker in post production, but the better choice is to have a careful lighting scenario.
- The cleaning of a surface should be done on the object and not on the image.

## 10. Photographing musical instruments

### 10.1. Definitions of positions and views

Due to the great variety of instrument morphology and the fact that terms like “front side”, “back side” etc. are not applicable throughout all kinds of instruments, it is often difficult to describe verbally the angle under which a musical instrument should be photographed. Therefore, the description of the three-dimensional orientation of an item on the photo set is replaced by two parameters how it should appear in the two-dimensional photographic representation. From these indications and the example images, it is comfortable to arrange the instrument on the photo-set and place the camera so that the wished result can be obtained.

### 10.2. The *position* parameter

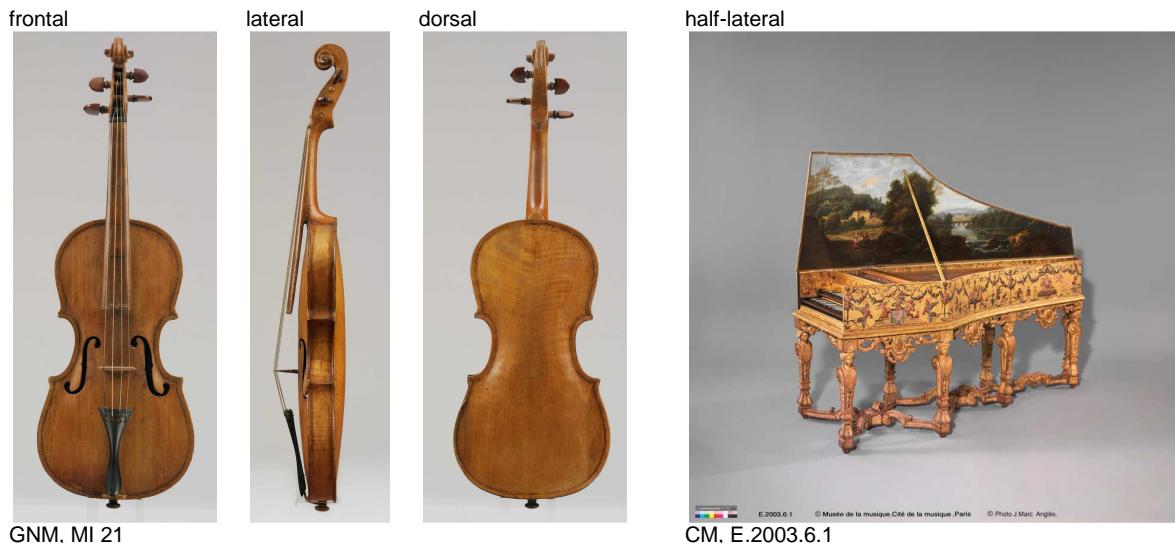
The *position* parameter does not refer to the three-dimensional orientation of the instrument in space, but to the line of its longest axis in the two-dimensional representation. Positions are:



The oblique position doesn't fix a specific angle. It often 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.

### 10.3. The *view* parameter

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



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 often employed to show e.g. guitars or viola da gambas with ornamented sides and backs. This latter type of view is optional.

In some cases, especially if the instrument's shape depends mainly from natural forms, the view can be *variable*, e.g. for shell horns.

Common combinations of these parameters are thus:

 HL Oblique position and half lateral view

 V Oblique position and variable 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. Typically, the instrument is standing or lying on a flat surface.

 F Horizontal position and frontal view

 L Horizontal position and lateral view

 D Horizontal position and dorsal 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, lateral side, or back side. In most cases, the instrument is lying or standing on a flat surface.

 F Vertical position and frontal view

 HL Vertical position and half lateral view

 L Vertical position and lateral view

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

## 11. Details for instruments and instrument groups

The main goal of the specifications given hereafter is to show the most interesting organological details supposed to be of the most use for a broad bandwidth of interested people. Consequently, the representation described in most cases doesn't show the playing position of the instrument. This is striking e.g. for violins where the playing position can't show important information like the shape, the proportions or the grain of the wood. Where the playing position doesn't infer with an organologically appropriate view, it is taken in account, e.g. for transverse flutes, harps or upright pianos.

In the following, the different instrument types are grouped in a simple, intuitive manner, without trying to establish a new organological system. In the beginning of each chapter, instruments belonging to different groups are recalled (e.g. organs = keyboard instrument and wind instrument).

The position and view parameters are given for the mandatory view.

## 12. Keyboard instruments

Nyckelharpa, see: String instruments with necks

### Wing-shaped keyboard instruments: Oblique position and half lateral view.

The instrument's keyboard appears in an oblique line from top left to bottom right. Lids should be opened to procure a maximum of organological information (mandatory). A half-closed and/or closed lid are recommended views to show the presumed historical playing set-ups (pianofortes) or the furniture aspect e.g. of decorated cases. Further recommended views are a bird's-eye view and, if applicable, a plans view of a painted lid.<sup>9</sup>



<sup>9</sup> It might be easier to photograph a detachable lid apart from the instrument, although this would be a detail photograph and not an overall view strictly spoken.



mandatory



recommended



recommended



recommended



recommended

Harpsichord (GNM, MIR 1073)



mandatory



recommended



recommended



recommended

Grand pianoforte (GNM, MIR 1102)



mandatory



recommended



recommended



recommended

Bentside spinet (GNM, MINe 90)



mandatory



recommended



recommended



recommended

Bentside pianoforte (GNM, MIR 1176)

**Regals: Oblique position and half lateral view.** Regals are shown with the bellows open which is farer away from the camera, if technically possible. If not, the closed view is sufficient.



mandatory / recommended



mandatory / recommended

Regal (GNM, MI 80)

**Rectangular or polygonal stringed keyboard instruments: Horizontal position and frontal view.** The keyboard is facing the camera in a horizontal line with the lid open for the sake of more organological information (mandatory). A half closed lid is recommended to show a possible historical playing setup, a closed lid to show the furniture aspect. An oblique-half lateral view can be added to give a better idea of the depth of the instrument.



automatic spinets  
clavichords  
double virginals

eolodicons  
nail pianos  
orphicas

physharmonicas  
spinets  
square pianos

terpodions  
virginals  
work box pianos



mandatory



recommended



recommended



recommended

Clavichord (GNM, MI 442)



mandatory



recommended



recommended



recommended

Virginal (GNM, MIR 1086)



mandatory



recommended



recommended



recommended

Square piano (GNM, MINe 171)

**Electric and electronic keyboard instruments: Horizontal position and frontal view.** The keyboard or a similar playing device is facing the camera in a horizontal line. For instruments with a stand or larger parts above the keyboard, the image layout can be described as: **Vertical position and frontal view.**



mandatory

Trautonium (ULEI, 4096)



mandatory

Electronic organ (CM, E.995.18.1)

**Upright keyboard instruments: Vertical position and frontal view.**

The keyboard is facing the camera in a horizontal line. The view with open keyboard flap is mandatory. The view with closed keyboard flap and – for organs closed doors, if existent – is recommended. For stringed instruments, a view with removed front panels to show the construction is recommended.



chamber organs  
clavicytheriums  
giraffe pianos

harmonicons  
harp pianos  
pianinos

portative organs  
positive organs  
procession organs

pyramid pianos  
reed organs



mandatory



recommended



recommended

Upright piano (piano console) (CM, E.2000.29.1)



mandatory



recommended



recommended

Giraffe piano (SMV-MTM, M466)



mandatory



recommended



mandatory

Physharmonika (GNM, MIR 1027)

Reed-organ (SMV-MTM, X5575)

**Accordions resp. hand harmonicas: oblique position and half lateral view / horizontal position and frontal view.**



The instrument should be positioned so that the treble keyboard is visible. An additional view with the bass keyboard visible is recommended. Instruments with large bellows are photographed frontally, the bellow opened in a U-shaped manner, so that both playing sides are visible. Instruments with protruding descant keyboard are photographed frontally.

bandoneons



mandatory

Accordion (MIM-BE, 4729)

concertinas

aeolas

hand-aeolines



mandatory

Accordion (MIM-BE, HB160)

**Hurdy-gurdies and organ hurdy-gurdies: Oblique position and half lateral view.** For hurdy-gurdies, a closed lid is mandatory, an open lid is recommended.



mandatory



recommended

Hurdy gurdy (GNM, MI 75)

**Push up piano players: Oblique position and half lateral view.**

A view of the front side (i. e. the side that is not facing the piano) is mandatory.

The view should be slightly from above and from the left to give an idea of the instrument's profile. If possible, one program carrier belonging to the player should be inserted (usually a perforated disc or a paper music roll), and if the player features a lid, this should be opened to allow a view on the sound carrier. A view with closed lid and a view of the back side (i.e. the side facing the piano) is recommended.



mandatory



recommended

Push up piano player (ULEI, 4058)

## 13. Woodwind instruments

Cornetts, see: Brass or other lip-vibrated instruments  
 Serpents, see: Brass or other lip-vibrated instruments  
 Mouth organs, see: Free reed wind instruments  
 Cane (walking stick) flutes, see: Cane (walking stick) instruments  
 Cane (walking stick) clarinets, see: Cane (walking stick) instruments

**Transverse flutes.** The main tone holes are facing the camera (mandatory), the mouth-hole is on the left side. A view of a different side is recommended, if there are important organological details:



Western traversos                      albisifonos  
 nose flutes                              didses  
 flauts



mandatory



recommended

Transverse flute with bass extension (GNM, MIR 326)

**Straight-form woodwind instruments, mainly end-blown: vertical position and frontal view.** “Straight-form” refers to the general extension of the instrument. Thus, bassoons and curtals are classified as “straight-form” for this purpose. The frontal view is mandatory, the dorsal view is recommended, if there are important organological details:



algaitas	contrabassophones	mayhorns	serpents
auloi	melodions	multiple flageolets	shakuhachis
bassoons	csakans	multiple flutes	shawms
bone flutes	curved cornettos	musettes	sonas
straight bassett	double flageolets	mute cornettos	sorduns
horns	dulcians	nays	straight bassett
cane bassett horns	dvojnice	oboe d'amores	horns
cane flutes	straight English	oboes	tabor-pipes
cane instruments	horns	panpipes	tarogatos
chalumeaus	flageolets	pommers	walking stick instruments
clarinets	giorgi flutes	racketts	windcap shawms
clarinets d'amore	heckelclarinas	recorders	zurnas
contrabassoons in bassoon-like shape	heckelphones	sarrusophones	
	hichirikis		



mandatory



recommended



mandatory



recommended



mandatory



recommended

Clarinet  
(GNM, MI 336)Oboe  
(GNM, MI 428)Recorder  
(GNM, MI 138)

mandatory



recommended



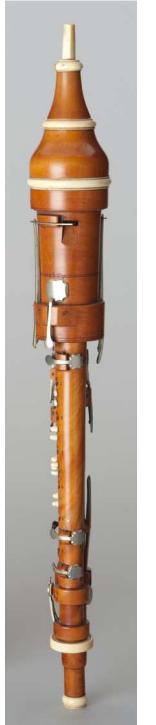
mandatory



recommended



recommended



recommended

Flageolet  
(GNM, MIR 229)Double flageolet (possibility of supplementary lateral views)  
(GNM, MIR 235)



mandatory

Bassoon  
(GNM, MI 472)



recommended



mandatory

Double bassoon  
(GNM, MIJ 21)



recommended



**Curved or angular woodwind instruments: Vertical position and half lateral view.** The instrument is placed in a way that the mouthpiece is in the top left of the photo, the body directed to the right (mandatory). A half dorsal view is recommended, if there are important organological details to show.

bass clarinets  
bass oboes  
saxophones  
crumhorns

contrabassoons  
with several  
windings  
pibcorns

tenor cornettos  
curved/angular  
basset horns

curved/angular  
cors anglais



mandatory

Saxophone (CM, E.715)



mandatory

Basset horn (GNM, MIR 466)



recommended

**Bagpipes: horizontal position and lateral view.** The bagpipe is placed in a way, that the bag and, if existing, the bellows are 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 visible.



zampognas  
musettes de cour

dudas  
cornemuses

bocks



mandatory

Musette de cour (CM, E.112)



mandatory

Bock (GNM, MIR 490)

**Pigeon whistles: Horizontal position and lateral view.** The instrument is shown as it is attached on the bird, the latter thought flying to the right side. A view on the top, showing the slits and labia, is recommended



mandatory

Pigeon whistle (MIM-BE, 2164-11)



recommended



mandatory

Pigeon whistle (MIM-BE, 0710)



recommended

## 14. Brass and other lip-vibrated wind instruments

Cane (walking stick) trumpet, see: Cane (walking stick) instruments

**Brass wind instruments whose bells are not directed upwards in playing position: Horizontal position and lateral view.** 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 directed to the right side.



aida trumpets	flugel horns	invention horns	natural trumpets
Büchels	fog horns	invention trumpets	orchester horns
clavicors	French horns	keyed horns	posthorns
cornets	glass trumpets	keyed trumpets	Russian horns
cornophones	harmonicors	Kuhlo-horns	slide trumpets
cupid's horns	helicons	military bugles	trumpet bugles
fanfare horns	hunting horns	natural horns	

Supplementary crooks belonging to instruments can be shown with the instrument. In this case, they should be oriented as if they were inserted. For instruments with many crooks, i.e. orchestral horns, a supplementary photo showing the crooks only should be considered.



mandatory (bell facing right)

Trumpet (UEDIN, EUCHMI 4568)



mandatory (facing left, valves visible)

Cornet (UEDIN, EUCHMI 1136)

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



**Bell over the shoulder instruments: Horizontal position and lateral view.** The bell is directed to the right of the image.



mandatory

Trombone (UEDIN, EUCHMI 5735)



mandatory

Saxhorn (ULEI, 1757)

**Horns with circular coils except post horns: Horizontal position and lateral view.** The blowpipe is on a horizontal line, the side containing the more important organological information is facing the camera: French horns, parforce horns.



mandatory  
French horn (UEDIN, EUCHMI 209)



mandatory  
Parforce horn (UEDIN, EUCHMI 3494)

**Posthorns: Horizontal position and lateral view.** The coil is oriented downwards, blowpipe and bell pointing symmetrically upwards, the bell oriented to the right. An orientation of the bell to the left is admitted if there are important organological details as finger holes to show.



mandatory  
Posthorn (UEDIN, EUCHMI 3052)



mandatory  
Posthorn with finger hole (UEDIN, EUCHMI 4454)

**Brass instruments whose bells are directed upwards in playing position:**

**Vertical position and lateral view.** 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:

tubas  
tenor horns  
ophicleides

bombardons  
barytons  
bass horns

saxhorns  
euphoniums  
lurs



mandatory

Saxhorn (MIM-BE, 2020)



mandatory

Bass tuba (GNM, MI 685)



mandatory

Tenor horn (GNM, MI 686)

**Shell horns: oblique position and variable view.** The instrument appears in an oblique line in the photo, but the view is variable, according to the instrument's form and special features.



mandatory

Shell horn (UEDIN, EUCHMI 3172)



mandatory

Shell horn (ULEI, 2423)

**Lip-vibrated wind instruments with finger holes: Vertical position and frontal view.** The finger holes are facing the camera. A view of the backside is recommended, if there are finger holes or interesting details.

Treble cornetts  
Mute cornetts  
Tenor cornetts

Serpents  
Bass cornets  
Cornettinos

Straight cornets  
Russian bassoons



mandatory



recommended



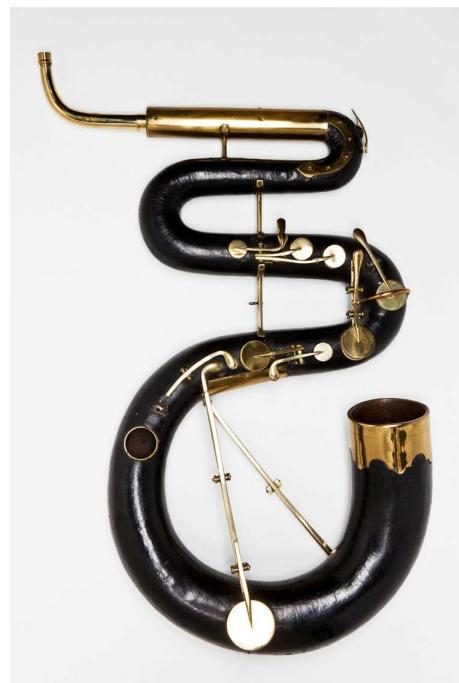
mandatory



recommended

Cornett (GNM, MI 119)

Mute cornett (GNM, MI 121)



mandatory

Serpent  
(UEDIN, EUCHMI 4440)



mandatory

Russian bassoon  
(GNM, MIR 49)

**Curved horns without coils: Horizontal position and lateral view.** The camera is at a right angle with the curve. For side-blown horns, the instrument can be inclined in deviating from the right-angle view in order to show the mouthpiece. If there are important organological details as finger holes which can be shown only with the bell to the left, this view is admitted as mandatory.



Alphorns  
hunting horns



mandatory (bell facing right)  
Bockhorn (SMV-MTM, N416)

oliphants  
transverse horns



(mandatory, if details on the left side)  
Kohorn (SMV-MTM, N13436)

crescents  
shepherd's horns



mandatory  
Side-blown horn (CM, E.140)

**Very large curved horns without coils** can be photographed upright, the bell facing to the right. If lighting permits, the photograph can be turned by a right-angle in post-processing to match the specification for smaller curved horns.

## 15. Free reed wind instruments

Harmoniums, see: keyboard instruments  
Accordions, see: keyboard instruments

**Mouth organs: Vertical position and lateral view.** The calabash is oriented to the bottom, the pipes to the top. The side containing the organological information is facing the camera. If there is no such a side, the mouthpiece is directed to the right:  
Shengs etc.



**Harmonicas: Oblique position and half-lateral view.** The instrument is shown in a way that the blowing apertures and the lid are visible.



mandatory

Harmonica  
(UEDIN, EUCHMI 2476)



mandatory

Sheng  
(CM, E.2294 )

## 16. Cane (walking-stick) instruments

**Cane resp. walking-stick instruments: horizontal position and frontal view.** This is independent of the mode of sound production and applies to flutes, clarinets, trumpets, violins or other. A view of the back or lateral side is recommended, if there are interesting organological details, and depending on the type of instrument.



## 17. String instruments with necks, bowed or plucked

Bowed zither, see: box-shaped string instruments

Bridge harps, see: harps

Vinas as tube zithers, see: tube zithers



**Lute- and violin-like instruments: Vertical position and frontal view.** A suspension of the particular object might be necessary, if the shape of the body doesn't allow a different fixing device (see Practical hints section). For examples see below.

accord guitars  
angelicas  
arpeggiones  
balalaikas  
bandolons  
bandurrias  
banjos  
bass citterns  
bass guitars

bassoon violins  
bent neck lutes  
bipanchi vinas  
biwas  
bowed mandolas  
bracs  
bumbasses  
cane violins  
cellos

chitarrones  
citterns  
cobzas  
colasciontinos  
concert guitars  
contrabasses  
contraltos  
crwths  
descant lutes

domras  
double neck guitars  
er hus  
esrars  
feles  
flamenco guitars  
gitterns

guitars with freerunning bass	lyras	shamisens	travel violins
strings	mandolins	silent violins	trumscheits
kacchapi vinas	mandoras	sitars	twin-neck guitars
kinnari vinas	nyckelharpas	small basses	uds
gusles	pandurinas	spike fiddles	ukuleles
harp citterns	philomeles	sultanas	Vinas: lute-like
key citterns	pipas	Swedish lutes	viola d'amores
kissars	pochettes	tamburas	viola da gambas
kits	rebabs	tanburs	violas
klarfideln	rebecs	tanburs	violins
lira da braccios	renaissance lutes	tars	western guitars
lyra citterns	rotas	theorbos	yue gins
lyra guitars	san xians	Thuringian Forest	
	sarangis	zithers	
	saz	torbanas	

**Instruments of the violin family: Vertical position and frontal view.** For the lateral view, the soundboard is directed to the left side. Care should be taken in lighting so that as less reflections as possible are visible on the top and the back, showing grain and wood colour as well as possible. To avoid distortion, the camera lens should be positioned at a height symmetrically between upper and lower corners. If possible in the workflow, the camera should be raised at the height of the scroll to take extra shots of this part without distortion.



mandatory



recommended



recommended



views on scroll



Violin (GNM, MI 21)



**Lute instruments: Vertical position and frontal view.** The frontal view is mandatory, lateral and dorsal views are recommended. In lateral view, the orientation of the strings depends on the orientation of the pegs, i.e. the lateral pegs should be visible, if their order is asymmetrical.



mandatory

Setar (SPK, IC 15351)



recommended



recommended



mandatory

Bipanchi vina (CM, E.796)



recommended



recommended

**Lute instruments with several peg-boxes: Vertical position and frontal view.** In lateral view, the strings are usually oriented to the right to show details of the peg-boxes.



mandatory

Bass Cittern (GNM, MI 65)



recommended



recommended

**Lute instruments with supplementary gourd resonators: Vertical position and frontal view.** To show the overall volumes of the instrument, a photo in oblique position and half lateral view is recommended, the instrument resting on its two resonators.



mandatory      recommended      recommended      recommended  
Sitar (MIM-BE, 4028)

**Spike fiddles: Vertical position and frontal view.**



**Nyckelharpa: Vertical position and frontal view.** The plan view on the instrument's strings, the peg-box oriented to the bottom of the image, is mandatory.



mandatory      recommended      mandatory  
Nyckelharpa  
(SMV-MTM, X5662)

Spike tube fiddle Endingidi (MIM-BE, 3606)

**Compound bow (pluriarc) instruments: Vertical position and half lateral view.** The oblique frontal view is mandatory, the half dorsal view is recommended.



mandatory



recommended

Bow lute lukombe (MIM-BE, 1927)

**Stick zithers: Horizontal position and lateral view.**

The calabash can be on either side or in the middle.



mandatory

Stick zither (RMCA, MO.0.0.36808)

## 18. Box-shaped string instruments, plucked, struck or bowed

See also: keyboard instruments

See also: harps

Open harps, see: harps

Angular harps, see: harps

**Non trapezoid zither instruments: Oblique position and half lateral view resp. horizontal position and lateral view.** The oblique angle is only slight to show volumes and a tuning device. A supplementary bird's eye view is recommended.



aliquodiums  
arpanetti  
autoharps  
bowed melodions  
bowed zithers  
Concert zithers  
descant zithers  
double zithers  
double psalmodicons  
non-symmetrical dulcimers  
epinettes des Vosges

harp zithers  
horn zithers  
kanteles  
keyed monochords  
kotos  
kratzzithers  
Mittenwald zithers  
monochords  
pedal dulcimers  
psalmodicons  
qanuns

raft zithers  
resonance zithers  
Salzburg zithers  
santurs  
struck zithers  
transverse zithers  
triple zithers  
vinas  
zithers without fingerboards



mandatory

Schlagzither (ULEI, 442)



mandatory

Accord zither (ULEI, 4056)



mandatory

Box zither Scheitholt (GNM, MIR 660)



mandatory

Raft zither(GNM, MINe 10 )



mandatory

Quanun (MIM-BE, ASI000)



mandatory

Zheng (MIM-BE, 2011.208 )

**Symmetrical dulcimers, hammered or plucked: Horizontal position and frontal view.** A bird's eye view is recommended.



mandatory

Hammered dulcimer (GNM, MI 249)



recommended

**Aeolian harps conceived for upright position: Vertical position and frontal view.** Depending on the type of instrument, other views, e.g. lateral or dorsal, can be added as recommended views.



mandatory



recommended

**Aeolian harps conceived for horizontal position: Horizontal position and frontal view.** Depending on the type of instrument, other views, e.g. lateral or dorsal, with or without lid, if present, can be added as recommended views.



mandatory

Aeolian harp (GNM, Inv.no MIR 738)



mandatory

Horizontal aeolian harp (GNM, MIR 734)



recommended

## 19. Tube zithers

Kacchapi vina, Kinnari vina, Bipanchi vina, and all other lute-like vinas, see: string instruments with necks

**Vinas: Oblique position and half lateral view.** The instrument is resting on its gourds. Vertical positions with frontal, lateral and dorsal views are recommended.



mandatory

recommended

recommended

recommended

Vina (MIM-BE, 0083)

**Whole tube zithers as valihas: Horizontal position and lateral view.** The mandatory view is showing the most important organological details. For more details, the instrument can be photographed from four sides in executing quarter turns.



mandatory



recommended

Whole tube zither Valiha (MIM-BE, 3799)

## 20. Harps

Aeolian harp, see: box-shaped string instruments  
Autoharp, see: string instruments with necks  
Nyckelharpa, see: string instruments with necks

**Frame harps: Vertical position and half-lateral view.** 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. A lateral view to show the proportions is recommended.



hook harps

pedal harps

diatonic harps

chromatic harps.



mandatory

Chromatic harp (CM, E.983.8.1)



mandatory

Hook harp (GNM, MIR 231)



recommended



**Bridge harps: Vertical position and frontal view.** The neck being (almost) in a same plane with the soundboard, the instrument is photographed like a lute-like instrument.



mandatory

Kora (MIM-BE, 2008.032)



recommended



recommended



**Open harps: Oblique position and half-lateral view.** A supplementary lateral view showing the angle of the neck is recommended.



mandatory



recommended

Arched harp Kundi (MIM-BE, Inv.no 3556)

## 21. Box-shaped mechanical instruments

mechanical pianos, see: keyboard instruments  
piano players, see: keyboard instruments

**Small, mostly rectangular programme music instruments: Oblique position and half-lateral view.** 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.



bird organs  
music boxes

organ clocks  
organettes

barrel organs  
serinettes



mandatory

Serinette (MIM-BE, 2001.010)



mandatory

Music box (MIM-BE, 1946)

## 22. Drums

Drums in anthropomorphic or zoomorphic shape, see: instruments in anthropomorphic or zoomorphic shape

**Slit drums in non-anthropomorphic shape: Oblique position and half-lateral view.**



**Shallow frame drums: vertical position and half-lateral view.** The view is obliquely on the membrane, showing at the same time the frame. A view from the backside is recommended, if there are important details.



tambourines

riqs

tars

bendirs



mandatory

Slit drum (MIM-BE, 1984.003)



mandatory

Riq (SPK, VII b 146)



recommended

**Drum instruments conceived for horizontal playing position: Oblique position and half-lateral view.** One membrane is visible. A photo on the other membrane is recommended.



mandatory



recommended

Drum played sideways (SPK, VII c 83)

**All hour-glass shaped drums, with or without variable tension: Oblique position and half-lateral view.** A lateral view, showing the profile shape, is recommended.



mandatory

Hour-glass shaped drum (MIM-BE, 692)



recommended

**Drums not played horizontally and friction drums: Vertical position and lateral view.** The drum is standing upright on one of the two membranes resp. the bottom of the body. The camera position is obliquely from above in a way to distort the body proportions as less as possible, but give an idea of the membrane.

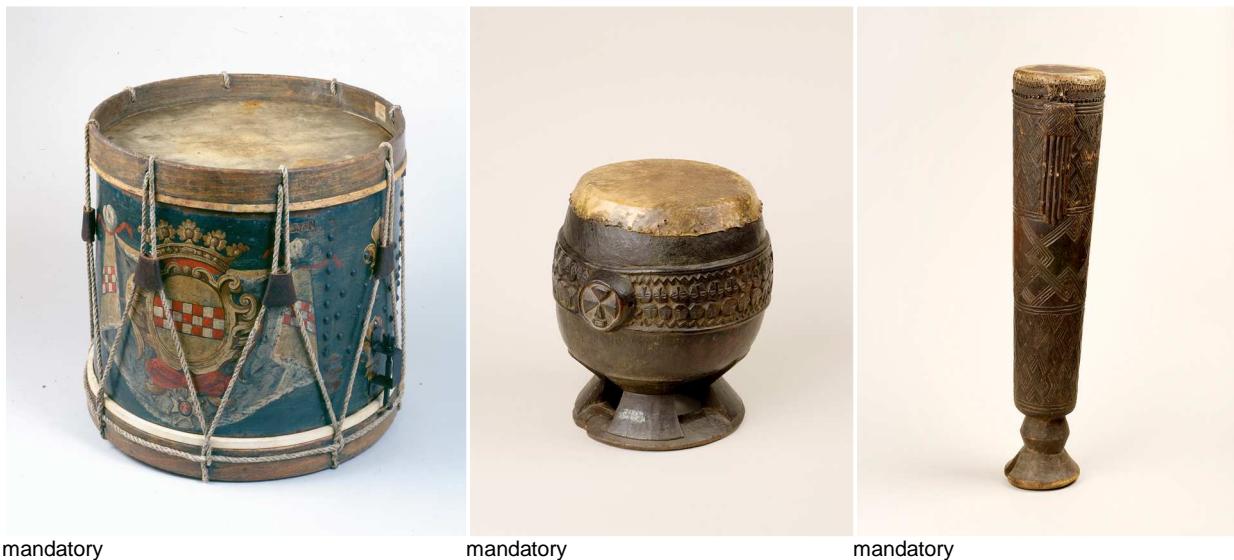


barrel drums  
conical drums  
cup-shaped drums  
cylindric drums

daikos  
foot drums  
friction drums  
kettledrums

lansquenet drums  
rommelpots  
side drums  
tablas

tsuzumis  
vessel drums



mandatory

Drum (ULEI, 1944)

mandatory

Drum (RMCA, MO.0.0.30974)

mandatory

Drum (RMCA, MO.1997.21.2)

**Long African and Asian drums (> 1,5 m): Horizontal position and lateral view.** The perspective showing a membrane is mandatory. A profile view showing the shape is recommended.



mandatory

Long African drum (MIM-BE, 323)



recommended

## 23. Rattles

**Strung rattles and rattles without handles: Oblique position and half lateral view.** Strung rattles are typically spread out on a flat surface and photographed obliquely from above. If there is a part of the string without fixed shells or with a device for fixing etc., this part is oriented to the top or top right of the photo. Rattles without any of these characteristics are shown obliquely in view showing their volume and function as well as possible.





mandatory

Strung rattle  
(RMCA, MO.1953.74.4070)



mandatory

Strung rattle  
(RMCA, MO.0.0.6006)



mandatory

Strung rattle  
(RMCA, MO.0.0.34952)



mandatory

Rattle without handle  
(RMCA, MO.1953.74.3270)



mandatory

Rattle without handle  
(RMCA, MO.1975.30.46)



mandatory

Rattle without handle  
(RMCA, MO.1953.74.3881)

**Vessel rattles with handles: Vertical position and lateral view.** They appear vertically with the handle oriented to the bottom of the image.



mandatory

Vessel rattle with han-  
dle (MIM-BE, 3209)



Vessel rattle with handle (MIM-BE, 3205)



Vessel rattle with handle (MIM-BE,  
1977.022)

## 24. Concussion idiophones (clappers, cymbals etc.)

**Concussion idiophones as clappers, cymbals etc.: Horizontal position and lateral view.** The camera sees the objects from above at an almost right angle, showing the more important side resp. sides. For a pair of cymbals, one element can show the hollow side, the other the dome. A lateral view to show the profile is recommended.



mandatory  
Cymbals (SPK, IC 23801)



mandatory  
Cymbals (SPK, IC 30113 a,b)



mandatory  
Cymbals (MIM-BE, 1979.009-05)



recommended



mandatory  
Cymbals (MIM-BE, AR0019)



recommended

**Castanets: Horizontal position and lateral view.** The cord, if still preserved, is at the top of the photo. Both shells are overlapping in an appropriate manner to show the cavity. The photo is taken from a bird's eye perspective. With a pair of castanets, one pair of shells can be entirely open.



mandatory  
Castanets (SPK, VII a 6)



mandatory  
Castanets (MIM-BE, 2010.047)

## 25. Bowed resp. friction idiophones

**Nail violins:** **Horizontal position and lateral view.** The side giving the most organological information is facing the camera. The photo is taken slightly from above to show the soundboard.



**Glass harmonicas:** **Horizontal position and frontal view.** The photo is taken slightly from above to show the glass shells.



**Musical saws:** **Vertical position and lateral view.** The cutting edge is directed to the right side of the image.



mandatory

Nail violin (MIM-BE, 1947)



mandatory

Glass harmonica (GNM, MI 408 )



mandatory

Musical saw  
(ULEI, 5194 )

## 26. Plucked idiophones

**Sansas:** **Oblique position and half-lateral view.** The tongues are appearing in an ascending line.



mandatory

Sansa (RMCA, MO.1993.5.9 )

## 27. Mallet idiophones

**Mallet instruments, played sideward:** **Oblique position and half-lateral view.** The view is slightly from above. In choosing the camera angle, attention should be made to show important organological details, e.g. bars and resona-



tors. The side from which the instrument is played is facing the camera. If this side cannot be determinate, either side can be chosen, and it is recommended to take images of both sides in order to make a possible later choice based on further research.

xylophones  
lithophones

metalophones  
vibraphones

marimbas  
gambangs

slentos



mandatory

Xylophone/gambang (CM, E.1116)



mandatory

Metallophone slento (CM, E.1117)

Special care should be taken for instruments whose different pitches are obtained more by differing thickness than by lengths of the lamellas. The oblique angle should be slight, and a horizontal view is accepted.



mandatory

Xylophone (RMCA, MO.0.0.31354-15)



mandatory

Xylophone (MIM-BE, 3854)

**Mallet instruments, played from the bass end: Vertical position and frontal view.** The bars are appearing in horizontal lines, seen from above, the lowest pitched bar to the bottom of the image.

metalophones

lithophones

straw fiddles

glockenspiels



mandatory

Glockenspiel (GNM, MIR 561) Straw fiddle (GNM, MIR 514)



mandatory

## 28. Struck upright or hanging idiophones

**Struck upright or hanging idiophones: Vertical position and frontal view.**  
Appropriate side and back views are recommended.



belts  
gongs

tam-tams  
triangles

tubular bells  
Turkish crescents



mandatory



recommended



recommended

Gong (CM, E.2000.11.1)

## 29. Trumps

**Trumpets, also called “jew’s harps”:** Horizontal position and dorsal view.  
The end where the tongue is plucked is located on the right side of the image.  
The view is obliquely from above.  
Finger activated trumpets, string activated trumpets.



mandatory

Trump (MIM-BE, 2008-040)



mandatory

Trump (MIM-BE, S 2629)



Trump (MIM-BE, 2001.060)

## 30. Musical bows

**Musical bows held upright: Vertical position and lateral view.** The curve of the bow is directed to the right side of the image. The instrument can be slightly turned (half-lateral) to show the cavity of a calabash:  
Berimbaus etc.



**Mouth-bows held horizontally or obliquely: Horizontal position and lateral view.** The curved side is oriented to the bottom of the image.



mandatory

Mouth bow (GNM, MIR 1259)

mandatory

Berimbau (MIM-BE, 3085)

## 31. Instruments in anthropomorphic or zoomorphic shape

**Slit drums in anthropomorphic shape: Vertical position and frontal view.** A view on the slits is mandatory. A view from a different side showing the sculptural quality of the object is recommended.



**Other Instruments in anthropomorphic or zoomorphic shape: Variable positions and views.** For the mandatory photo, position and view should be chosen so that the sculptural character of the instrument is stressed, if possible, also showing organological features. Recommended photos can show the playing position (if different) or organological details. A representation showing the sculptural quality and, if possible, organological details is mandatory. A supplementary view showing the playing position and/or important organological details is recommended.



mandatory



recommended



mandatory



recommended

Anthropomorphic slit-drum (MIM-BE, 1984.008)

Whistle (MIM-BE, 1838 )

## 32. Sets of musical instruments

**Consistent sets of instruments: Horizontal position and frontal view.** They disposed in playing setup, photographed from an audience (mandatory) or player's (recommended) view:  
Gamelans, drum sets etc.



mandatory



recommended

Drum set (CM, E.996.4.1)

## 33. Parts of musical instruments

An exception to the focus of this paper on entire musical instrument views are some important parts being crucial for playing, but which can't always be attributed to a certain instrument.

**String instrument bows: Horizontal position and lateral view.** The frog resp. the holding is directed to the right, the stick to the top, the hair to the bottom. For bows of violins and the like an extra photo of the frog and the tip is recommended.



mandatory



recommended



recommended

Violin bow (MIM-BE, 238)

**Mouthpieces of brass wind instruments: Vertical position and lateral view.** A view slightly from above on the cup is recommended.



**Beaters for percussion and hammered string instruments: Horizontal position and lateral view.** The handle end is directed to the right, the head to the left.



mandatory



recommended



recommended



mandatory



Drum beater (GNM, MIR 634A)

Pair of drumsticks (GNM, MIR 640A,B)

## 34. Instruments 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.



Xylophone manza (MIM-BE, 3219)



Xylophone manza (MIM-BE, 817)



Clavichord (GNM, MINe 60 A)

## 35. Miscellaneous

**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 depends both on form characteristics of the object and on details which should be shown. In most cases, an oblique position and a half lateral view is appropriate.

**Different idiophones:** **Shaken idiophones, scraped idiophones.** The position of the instrument is depending on form characteristics and special details of the object:  
Stamping sticks, scrape vessels, bull-roarers, ratchets.

## 36. Practical hints for serial digitisation

Based on the practical work with digitising, all partners of the MIMO project would like to share their experience to make photographing processes more efficient and more reliable in accordance with conservational aspects. In applying some of these hints, it should be checked which of them are useful for a particular scenario.

### Responsibility, care and security

The responsible person for the musical instruments to be photographed, normally the collection's curator should supervise the entire photographing process and should ideally be present to answer questions or take decisions. A conservator should equally be present to allow a secure handling of the instruments and to prevent them from risky operations. Instruments should only be handled by trained staff and under generally accepted museum standards. Operations like dusting, suspending, fixing instruments and the use of adhesive or any other potentially harmful materials and procedures should only be executed by trained personnel and in the case of doubt, a conservator's advice should be asked. In photography environments, care should also be taken to avoid harmful exposure to heat, UV-rays and other environmental influences as undue climatic conditions.

Make sure that transporting and storing ways and devices comply to common law in order to avoid accidents and legal pursuit.

### Organisation

As musical instruments present a great variety of shapes, sizes, materials, weights and surface structures, photographing them on a high-quality level in a serial process in an efficient procedure in compliance with conservational needs is a challenge. The procedure has thus to be thoroughly organised.

If the particular budget allows enough staff, each of them should be responsible for definite assignments in order to work efficiently together: taking minutes, positioning and returning musical instruments, fetching not yet photographed items, naming and checking images etc.

For proceeding fast, it is essential to group beforehand instruments with similar characteristics, as determined by photographic needs. Some of the respective parameters might thus not correspond to common organological practice, where others do:

- size (e.g. group square pianos in descending length)
- type (e.g. instruments of the violin family)
- suspension type (instruments standing alone, as most clarinets vs. instruments needing a security fixing, as bassoons)
- surface reflectance (polished brass instruments vs. terra cotta darabukkas)
- place on the photoset (on the floor vs. on a table)
- colour (ebony and lighter background vs. ivory and darker background)

Every change of one of these parameters may necessitate a time-consuming change of the lighting, lenses, camera position or the presentation environment of the instruments.

Precise checklists with instruments per photo session are an efficient means to know what has to be fetched and what has already been photographed. Photographed items should be registered and can be marked us such, e.g. by loosely tying a cotton thread around them or add a paper label. For being sure about marking methods, a conservator's advice should be asked.

To avoid confusion in putting back instruments in showcases and storing facilities, it is useful to take a snapshot of the particular situation.

Instruments should be prepared in advance by checking their condition or dusting them before going to the photoset. The transport ways between collection resp. reserve and photoset

should be as short as possible to save time and to minimize transporting risks and harsh climatic changes. If space permits, makeshift studios can be set up in the reserves.

Photographing instruments in a publicly accessible space in a museum can be a good publicity action. But before doing this, make sure to work in the most professional and secure environment to give a positive example on how to document and handle musical instruments.

## Photographing

As said in the introduction, no technical advice shall be given here to professional photographers, seen that they know their profession. However, some organizational hints might be useful to facilitate museum management in serial digitization.

File naming for images on the photo set should imperatively use the object's inventory number as most reliable identifier, adding, if necessary, suffixes etc. if different views of an instrument are taken. It goes without saying that the technical metadata should always be preserved during saving, naming, post-processing etc.

A quality check of the images is indispensable; best is to do it immediately after the image is taken, this might slightly slow down a particular photo session, but keeps from having to fetch and prepare an item a second time. Checking should not be left to the photographer alone, but should be executed by trained museum staff in taking in using the photographer's technical expertise.

The object should not fill the entire image surface. Space should be let around for cropping, and rulers, inventory numbers, logos, color charts possibly taken and their respective shadows should not disturb this space.

## Presenting instruments on the photo set

**Please note:** In the following, all advices concerning the presentation of instruments on the photo set should be checked before using them and applied by trained and reliable staff. If a method seems too risky, it is better to search for a different means to obtain a similar result. Neither the authors nor the members of the MIMO project having procured these advices can take any responsibility for damages occurred elsewhere in applying them.

To secure e.g. wind instruments photographed standing upright, a flexible wire covered by a smooth material can be passed through the photo table. An appropriate squeezing device makes the length adjustable. Another way is to have holes of different diameters drilled in a plank between photo table and background paper, in which smoothed wooden rods of different lengths and diameters can be inserted. Whatever method is used, the wire or rod should be black to be less apparent in the finger holes. Inserting something in a woodwind instrument's bore should always be done with extreme caution and only if necessary.

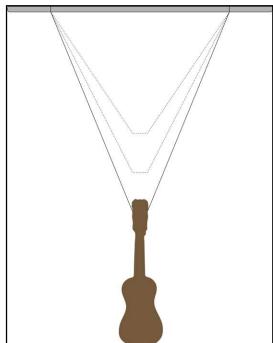
Security suspensions, e.g. for bassoons standing upright, can be fixed and adjusted in a quick flexible manner in fixing nylon wires to a transversal suspending bar by winding these wires two to three times around a portion of the bar equipped with double adhesive tape. Touching the adhesive surface with gloves should be avoided, and the adhesive force of the tape should be checked frequently to replace it in time. A surplus length of the wire can be attached to another portion of double adhesive tape fixed at a different point of the bar.

A quick and secure suspension method for stringed instruments with necks and pegs (lutes, violins etc.) consists in fixing a sling of nylon-wire to a bar. Fixing several wires in different



Flexible, adjustable wire seen from underneath the photo table  
photo ULEI

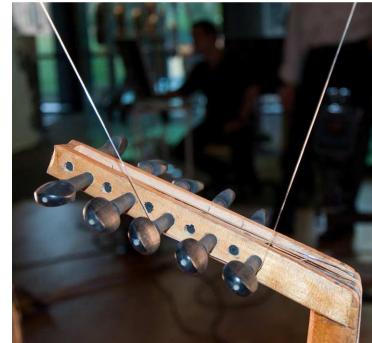
lengths prepares for instruments in different sizes. Instruments are suspended in the wire by their pegs, what works for frontal, dorsal and lateral views. Before suspending an instrument, double-check if the pegs are well fixed and solid enough and if the geometry of the instrument permits it. A wire running in front of a non-ornamental peg can in general easily be re-touched.



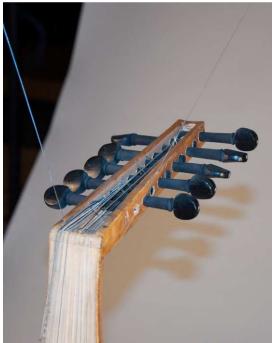
The fixing device  
all photos and drawing GNM



for lateral views



for frontal/dorsal views



To fix small objects on a surface or to prevent them from rolling away, photographers often use a flexible adhesive paste which contains grease and lets residues on the instruments' surfaces, as Hama Haftpast (TM). A better solution is to use natural rubber paste as Groom Stick (TM) as it is used in paper conservation for cleaning or clean bees wax. It needs a little bit of practice to hold the instrument with one hand wearing a glove and applying the paste with the other bare hand. Applying any adhesive to worn or textile surface might be harmful. Before applying any adhesive, a conservator's advice should be asked.

A quick solution for photographing mouthpieces, necessitating post-production: First, the mouth-piece is photographed using a supporting arm, if wished, in different positions, then the arm is put away in post-processing.



mouthpiece support (MIM-BE)  
all photos MIM-BE



mandatory



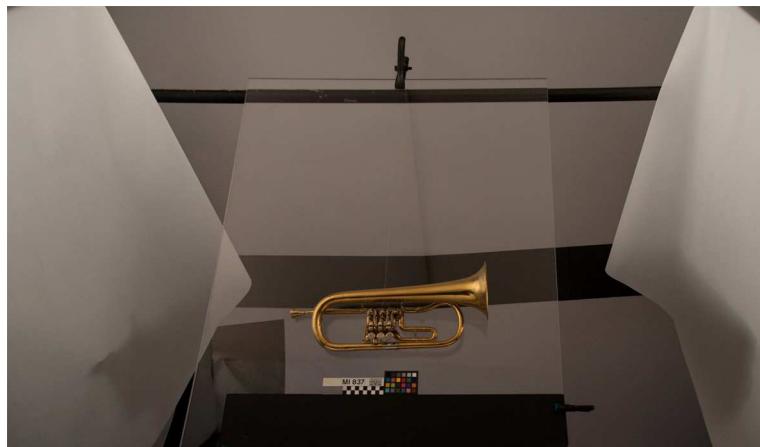
recommended



recommended

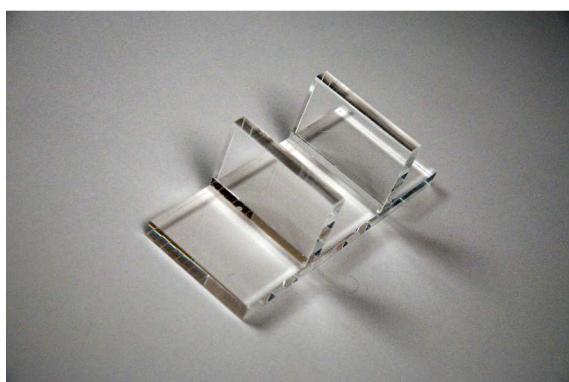
Another quick solution for photographing mouthpieces, mostly avoiding post-production, is to put them on a square Plexiglas rod which is scarcely visible in the photo.

To avoid shadows on the background, objects can be placed on a clear Plexiglas sheet at a sufficient distance from the background. It is important to give the background an even lighting in order to keep it uniform. A careful lighting on the object itself and the use of a polarizing filter helps avoiding the object's reflecting contour on the Plexiglas.



Plexiglas background device, here for trumpets. The black stripe in the background retaining unwished reflections doesn't appear in the final visual field. The instrument is secured from slipping away on the inclined surface by a nylon wire fixed on the black clamp on top of the Plexiglas sheet.  
photo GNM

To position violins and other such instruments, which don't stand upright for photographing on their own, set them in a Plexiglas ring, in a water glass or in a double-T-form Plexiglas stand with smoothed edges.



Plexiglass-stand  
all photos GNM

## 37. Index

Position and view parameters are given in short form, e.g.: "Oblique / half lateral" = "Oblique position and half lateral view".

### A

Abanangbweli: vertical / frontal  
 Accordion: oblique / half lateral  
 Accordzither: oblique / half lateral  
 Adufe: oblique / half lateral  
 Adungu: oblique / half lateral  
 Aeolian harp, played horizontally: horizontal / frontal  
 Aeolian harp, played vertically: vertical / frontal  
 Aeolian organ: vertical / frontal  
 Agogo: oblique / half lateral  
 Alboka: horizontal / lateral  
 Algaita: vertical / frontal  
 Algoja: vertical / frontal  
 Alphorn: horizontal / lateral  
 Althorn: horizontal / lateral  
 Alto bugle: horizontal / lateral  
 Alto clarinet: vertical / half lateral  
 Alto crumhorn: vertical / half lateral  
 Alto dulcian: vertical / frontal  
 Alto fagotto: vertical / frontal  
 Alto flugelhorn: horizontal / lateral  
 Alto flute: vertical / half lateral  
 Alto horn: vertical / lateral  
 Alto keyed bugle: horizontal / lateral  
 Alto ophicleide: vertical / lateral  
 Alto rothophone: vertical / half lateral  
 Alto saxhorn: vertical / lateral  
 Alto saxophone: vertical / half lateral  
 Alto saxotromba: vertical / lateral  
 Alto shawm: vertical / frontal  
 Alto trombone: horizontal / lateral  
 Amakondere: horizontal / lateral  
 Ambassa: vertical / frontal  
 Anata: vertical / frontal  
 Angel lute: vertical / frontal  
 Angklung: vertical / lateral  
 Antiphonel: vertical / half lateral  
 Anzona: vertical / frontal  
 Aporo: vertical / frontal  
 Appalachian dulcimer: oblique / half lateral  
 Arch harp-lute: vertical / frontal  
 Arched harp: oblique / half lateral  
 Archicistre: vertical / frontal  
 Archlute: vertical / frontal  
 Arghul: vertical / frontal  
 Armandine: oblique / half lateral  
 Arpanetta: vertical / half lateral  
 Arpeggione: vertical / frontal  
 Arpi Guitare: vertical / frontal  
 Arpicordo: oblique / half lateral  
 Assa muta chati: oblique / half lateral  
 Atamo: vertical / frontal  
 Aulos: vertical / frontal  
 Autoharp: oblique / half lateral  
 Automatic piano: horizontal / frontal  
 Azibwazi: horizontal / frontal

### B

Bagili: vertical / lateral  
 Baglama: vertical / frontal

Bagpipe: vertical / half lateral  
 Bajiao gu: vertical / half lateral  
 Cajon: vertical / frontal  
 Bak: oblique / half lateral  
 Balafon: oblique / half lateral  
 Balalaika: vertical / frontal  
 Ballad horn: horizontal / lateral  
 Bamboo pipe: vertical / frontal  
 Banam: vertical / frontal  
 Bandoneon: oblique / half lateral  
 Bandora: oblique / half lateral  
 Bandura: vertical / frontal  
 Bandurria: vertical / frontal  
 Banhu: vertical / frontal  
 Banjo: vertical / frontal  
 Banjo-mandolin: vertical / frontal  
 Banjulele: vertical / frontal  
 Bantu: oblique / half lateral  
 Barbiton: vertical / frontal  
 Bargumi: horizontal / lateral  
 Baritone bugle: horizontal / lateral  
 Baritone flugelhorn: horizontal / lateral  
 Baritone rothophone: vertical / half lateral  
 Baritone saxhorn: vertical / lateral  
 Baritone saxophone: vertical / half lateral  
 Baritone saxotromba: vertical / lateral  
 Baritone sudophone: vertical / lateral  
 Barrel drum: vertical / frontal  
 Barrel organ: vertical / half lateral  
 Baryton: vertical / frontal  
 Basetly: vertical / frontal  
 Basi: vertical / frontal  
 Bass bugle: horizontal / lateral  
 Bass clarinet: vertical / half lateral  
 Bass cornett: vertical / frontal  
 Bass crumhorn: vertical / half lateral  
 Bass drum: vertical / frontal  
 Bass dulcian: vertical / frontal  
 Bass flugelhorn: horizontal / lateral  
 Bass flute: horizontal / frontal  
 Bass guitar: vertical / frontal  
 Bass horn: vertical / lateral  
 Bass new violin: vertical / frontal  
 Bass ophicleide: vertical / lateral  
 Bass recorder: vertical / frontal  
 Bass rothophone: vertical / half lateral  
 Bass saxhorn: vertical / lateral  
 Bass saxophone: vertical / half lateral  
 Bass shawm: vertical / frontal  
 Bass sordun: vertical / frontal  
 Bass trombone: horizontal / lateral  
 Bass trumpet: vertical / lateral  
 Bass tuba: vertical / half lateral  
 Basse de musette: vertical / frontal  
 Basse de violon: vertical / frontal  
 Basset clarinet: vertical / frontal  
 Basset horn: vertical / frontal  
 Basset recorder: vertical / frontal  
 Basson d'amour: vertical / frontal  
 Bassonore: vertical / frontal  
 Bassoon: vertical / frontal  
 Basuri: horizontal / frontal  
 Bata: oblique / half lateral  
 Battery: horizontal / frontal  
 Bauu: horizontal / frontal  
 Baya: vertical / frontal  
 Baz: vertical / frontal  
 Bazombe: vertical / lateral

Beatbox: oblique / half lateral  
 Beganna: vertical / frontal  
 Bell: vertical / frontal  
 Bell harp: vertical / frontal  
 Bendir: vertical / half lateral  
 Bengala: vertical / frontal  
 Berimbau: vertical / half lateral  
 Bersag horn: horizontal / lateral  
 Bianqing: horizontal / frontal  
 Bianzhong: vertical / frontal  
 Bilangdao: vertical / frontal  
 Bimbonifono: vertical / lateral  
 Bin: oblique / half lateral  
 Biniou: vertical / half lateral  
 Bird instrument: oblique / half lateral  
 Bissex: vertical / frontal  
 Biwa: vertical / frontal  
 Bladder pipe: vertical / half lateral  
 Bo: horizontal / lateral  
 Board zither: oblique / half lateral  
 Boatswain's call: horizontal / lateral  
 Bodhran: vertical / half lateral  
 Bokongo: vertical / lateral  
 Bolange: oblique / half lateral  
 Bolon: vertical / frontal  
 Bombarde: vertical / frontal  
 Bombardon: vertical / lateral  
 Bonang: oblique / half lateral  
 Bongos: vertical / frontal  
 Bouhe: vertical / half lateral  
 Bouzouki: vertical / frontal  
 Bow: horizontal / lateral  
 Bowed zither: oblique / half lateral  
 Bowl lyre: vertical / frontal  
 Bozhong: vertical / frontal  
 Bronze drum: vertical / frontal  
 Buccin: horizontal / lateral  
 Buccina: vertical / lateral  
 Buche des Flandres: oblique / half lateral  
 Buchla: horizontal / frontal  
 Bucium: horizontal / lateral  
 Bugle: horizontal / lateral  
 Buhai: vertical / frontal  
 Bullroarer: oblique / half lateral  
 Bumbass: vertical / frontal  
 Buruw: horizontal / lateral  
 Buzuq: vertical / frontal

## C

Cabinet pianoforte: vertical / frontal  
 Cabrette: vertical / half lateral  
 Cajon: vertical / half lateral  
 Caledonica: vertical / frontal  
 Cane flute: vertical / frontal  
 Cane oboe: vertical / frontal  
 Cane violin: vertical / frontal  
 Canh: vertical / frontal  
 Cap ke: vertical / frontal  
 Carillon: vertical / frontal  
 Carnyx: vertical / half lateral  
 Castanets: horizontal / lateral  
 Cavaquinho: vertical / frontal  
 Cecilium: vertical / frontal  
 Celesta: horizontal / frontal  
 Celestina: vertical / frontal  
 Cencerro: vertical / frontal  
 Ceterone: vertical / frontal

Chabara: horizontal / lateral  
 Chalmei: vertical / half lateral  
 Chalumeau: vertical / frontal  
 Chalumeau double: vertical / frontal  
 Chamber organ: vertical / frontal  
 Changgo: vertical / frontal  
 Chap: horizontal / lateral  
 Charango: vertical / frontal  
 Chekker: horizontal / frontal  
 Chi: horizontal / frontal  
 Chiboni: vertical / half lateral  
 Chime bar: horizontal / frontal  
 Ching: vertical / frontal  
 Chipendani: vertical / lateral  
 Chirawatta: vertical / frontal  
 Chirimia: vertical / frontal  
 Chitarra battente: vertical / frontal  
 Chitende: vertical / lateral  
 Chizeze: vertical / frontal  
 Chogur: vertical / frontal  
 Choke cymbal: horizontal / lateral  
 Chromatic harp: vertical / half lateral  
 Chum choe: horizontal / lateral  
 Chwago: vertical / frontal  
 Cikara: vertical / frontal  
 Cimbasso: vertical / lateral  
 Citole: vertical / frontal  
 Cittern: vertical / frontal  
 Clappers: oblique / half lateral  
 Claquebois: horizontal / frontal  
 Claquoir: vertical / half lateral  
 Clarinet: vertical / frontal  
 Clarinette d'amour: vertical / frontal  
 Clarsach: vertical / half lateral  
 Clavecin brisé: oblique / half lateral  
 Clavecin oculaire: oblique / half lateral  
 Claves: oblique / half lateral  
 Clavichord: horizontal / frontal  
 Clavicor: horizontal / lateral  
 Clavicytherium: vertical / frontal  
 Claviharpe: vertical / frontal  
 Clavi-lame: horizontal / frontal  
 Clavioline: horizontal / frontal  
 Claviorgan: vertical / frontal  
 Coach horn: horizontal / lateral  
 Cobza: vertical / frontal  
 Colascione: vertical / frontal  
 Componium: vertical / frontal  
 Concertina: oblique / half lateral  
 Conch-shell trumpet: oblique / half lateral  
 Cong: vertical / frontal  
 Congas: vertical / frontal  
 Conical drum: vertical / frontal  
 Console piano: horizontal / frontal  
 Contrabass bugle: horizontal / lateral  
 Contrabass ophicleid: vertical / lateral  
 Contrabass saxhorn: vertical / lateral  
 Contrabass sordun: vertical / frontal  
 Contrabass tuba: vertical / lateral  
 Contralto saxhorn: vertical / lateral  
 Contrebasse à anche: vertical / lateral  
 Cornamusa: vertical / frontal  
 Cornet: horizontal / lateral  
 Cornett: vertical / frontal  
 Cornettino: vertical / frontal  
 Cornopean: horizontal / lateral  
 Cornophone: vertical / lateral  
 Cornu: vertical / lateral

Courtaut: vertical / frontal  
 Cowbells: vertical / frontal  
 Crash cymbal: horizontal / lateral  
 Crotal: horizontal / frontal  
 Crumhorn: vertical / half lateral  
 Crwth: vertical / frontal  
 Crystal Baschet: oblique / half lateral  
 Cuckoo (in recorder-like shape): vertical / frontal  
 Cumbus: vertical / frontal  
 Cura kaval: vertical / frontal  
 Curtal: vertical / frontal  
 Cylindrical drum: vertical / frontal  
 Cymbals: horizontal / lateral  
 Cymbalum: oblique / half lateral

## D

Daf: vertical / half lateral  
 Dagu: vertical / frontal  
 Daire: vertical / half lateral  
 Daluo: vertical / frontal  
 Damaha: vertical / frontal  
 Damaru: oblique / half lateral  
 Damau: vertical / frontal  
 Dan buau: oblique / half lateral  
 Dan cong chien: vertical / frontal  
 Dan day: vertical / frontal  
 Dan gao: vertical / frontal  
 Dan moi: horizontal / dorsal  
 Dan nguyet: vertical / frontal  
 Dan nhi: vertical / frontal  
 Dan tam: vertical / frontal  
 Dan tinh: vertical / frontal  
 Dan tranh: oblique / half lateral  
 Dan t'rung: oblique / half lateral  
 Dan ty ba: vertical / frontal  
 Dan xen: vertical / frontal  
 Daph: vertical / half lateral  
 Darabukka: vertical / frontal  
 Davul: oblique / half lateral  
 Decacord: vertical / frontal  
 Def: vertical / half lateral  
 Descant recorder: vertical / frontal  
 Dessus de musette: vertical / frontal  
 Dhak: oblique / half lateral  
 Dhimay: oblique / half lateral  
 Dhol: oblique / half lateral  
 Dholak: oblique / half lateral  
 Di: horizontal / frontal  
 Diatonic accordion: oblique / half lateral  
 Diatonic harp: vertical / half lateral  
 Dibu: vertical / frontal  
 Dibu dimbwa: vertical / frontal  
 Dibu dimbwa: vertical / frontal  
 Dibu dinganga: vertical / frontal  
 Didjeridu: vertical / frontal  
 Digital harpsichord: horizontal / frontal  
 Digital pianoforte: horizontal / frontal  
 Dilruba: vertical / frontal  
 Dinh nam: vertical / lateral  
 Diple: vertical / frontal  
 Dital harp: vertical / frontal  
 Djouak: vertical / frontal  
 Djembe: vertical / frontal  
 Djouak: vertical / frontal  
 Dobatsu: horizontal / lateral  
 Dobro: vertical / frontal  
 Dolzaina: vertical / frontal  
 Dombra: vertical / frontal

Domo: oblique / half lateral  
 Dongxiao: vertical / frontal  
 Donno: oblique / half lateral  
 Doppioni: vertical / frontal  
 Dora: vertical / frontal  
 Dotara: vertical / frontal  
 Double bass: vertical / frontal  
 Double bassoon: vertical / frontal  
 Double clarinet: vertical / frontal  
 Double flageolet: vertical / frontal  
 Double flute: vertical / frontal  
 Double horn: horizontal / lateral  
 Double psaltery: horizontal / frontal  
 Double zither: oblique / half lateral  
 Dril-bu: vertical / frontal  
 Drum, played vertically: vertical / frontal  
 Duct flute: vertical / frontal  
 Duduk: vertical / frontal  
 Dudy: vertical / half lateral  
 Duff: vertical / half lateral  
 Dulali: vertical / frontal  
 Dulcian: vertical / frontal  
 Dulcimer: oblique / half lateral  
 Dumbelek: vertical / frontal  
 Dung-chen: horizontal / lateral  
 Dung-dkar: oblique / half lateral  
 Duplex: horizontal / lateral  
 Dutar: vertical / frontal  
 Dvojnice: vertical / frontal

## E

Echo cornet: horizontal / lateral  
 Ekatantri vina: vertical / frontal  
 Ekinimba: vertical / frontal  
 Ekole: oblique / half lateral  
 Ekonting: vertical / frontal  
 Ektara: vertical / frontal  
 Electric bass guitar: vertical / frontal  
 Electric guitar: vertical / frontal  
 Electric harpsichord: horizontal / frontal  
 Electric organ: horizontal / frontal  
 Electric piano: horizontal / frontal  
 Electric violin: vertical / frontal  
 Electronic organ: horizontal / frontal  
 Embilta: vertical / frontal  
 Embuchi: horizontal / lateral  
 Enanga: oblique / half lateral  
 End blown flute: vertical / frontal  
 Endingidi: vertical / frontal  
 Engalabi: vertical / frontal  
 English guitar: vertical / frontal  
 English horn: vertical / frontal  
 Enkwanzi: vertical / frontal  
 Ennanga: oblique / half lateral  
 Epinette des Vosges: oblique / half lateral  
 Eraqyeh: vertical / frontal  
 Erhu: vertical / frontal  
 Exian: vertical / frontal  
 Esraj: vertical / frontal  
 Eunuch flute: vertical / frontal  
 Euphonicon: horizontal / frontal  
 Euphonium: vertical / lateral  
 Experimental violin: vertical / frontal

## F

Fairground organ: vertical / frontal  
 Faluo: oblique / half lateral

Fanfare trumpet: horizontal / lateral  
 Fenghuangqin: oblique / half lateral  
 Fiddle: vertical / frontal  
 Fife: horizontal / frontal  
 Flageolet: vertical / frontal  
 Flexatone: oblique / half lateral  
 Flicorn soprano: horizontal / lateral  
 Flicorn, played upright: vertical / lateral  
 Flugelhorn: horizontal / lateral  
 Fluer: vertical / frontal  
 Flute (transverse): horizontal / frontal  
 Flûte à bec colonne: vertical / frontal  
 Flûte d'accord: vertical / frontal  
 Flûte d'amour: horizontal / frontal  
 Flûte harmonique: vertical / frontal  
 Flûte Vermeulen: vertical / frontal  
 Flûtet: vertical / frontal  
 Fodrahi: vertical / frontal  
 Fonic: vertical / frontal  
 Frame drum: vertical / half lateral  
 Friction drum: vertical / frontal  
 Frua: vertical / frontal  
 Fue: horizontal / frontal  
 Fujara: vertical / frontal  
 Furulya: vertical / frontal

## G

Ga: vertical / frontal  
 Gadulka: vertical / frontal  
 Gaita: vertical / half lateral  
 Gajde: vertical / half lateral  
 Gakudaiko: vertical / frontal  
 Galoubet: vertical / frontal  
 Gambang: oblique / half lateral  
 Gambus: vertical / frontal  
 Gamelan: horizontal / frontal  
 Ganga: vertical / half lateral  
 Garawung: vertical / frontal  
 Gardon: vertical / frontal  
 Gasba: vertical / frontal  
 Gaza: vertical / frontal  
 Gekkin: vertical / frontal  
 Geling: vertical / frontal  
 Gemshorn: vertical / half lateral  
 Gendang: oblique / half lateral  
 Gender: oblique / half lateral  
 Ghanta: vertical / frontal  
 Ghayta: vertical / frontal  
 Gheteh: vertical / frontal  
 Ghichak: vertical / frontal  
 Ghugha: vertical / frontal  
 Gibeemba: vertical / frontal  
 Giorgi flute: vertical / frontal  
 Giraffe piano: vertical / frontal  
 Gittern: vertical / frontal  
 Glass glockenspiel: horizontal / frontal  
 Glasschord: horizontal / frontal  
 Glaw ng yao: vertical / frontal  
 Glockenspiel: horizontal / frontal  
 Gmebaphone: horizontal / frontal  
 Gmebogosse: horizontal / frontal  
 Go: vertical / frontal  
 Goblet drum: vertical / frontal  
 Gong: vertical / frontal  
 Gong ageng: vertical / frontal  
 Gopiyanza: vertical / frontal  
 Gora: vertical / lateral

Gralla: vertical / frontal  
 Grand fortepiano: oblique / half lateral  
 Great bass clarinet: vertical / half lateral  
 Great bass shawm: vertical / frontal  
 Grossbass recorder: vertical / frontal  
 Guan: vertical / frontal  
 Guinbri: vertical / frontal  
 Guiro: oblique / half lateral  
 Guitar: vertical / frontal  
 Guitarron: vertical / frontal  
 Gusle: vertical / frontal

## H

Hajhuj: vertical / frontal  
 Handbell: vertical / frontal  
 Hansho: vertical / frontal  
 Hardanger fiddle: vertical / frontal  
 Harmonica: oblique / half lateral  
 Harmonichord: oblique / half lateral  
 Harmoni-cor: horizontal / lateral  
 Harmonieflute: vertical / frontal  
 Harmonium: vertical / frontal  
 Harp: vertical / half lateral  
 Harp guitar: vertical / frontal  
 Harp lute: vertical / frontal  
 Harp lyre: vertical / frontal  
 Harpsichord: oblique / half lateral  
 Harpsichord-piano: oblique / half lateral  
 Hautbois de Poitou: vertical / frontal  
 Hawaiian guitar: vertical / frontal  
 Heckelphone: vertical / frontal  
 Helicon: horizontal / lateral  
 Heliphon: horizontal / frontal  
 Hichiriki: vertical / frontal  
 High treble shawm: vertical / frontal  
 High treble viol: vertical / frontal  
 Hit-hat mounted jingles: vertical / frontal  
 Hityogiri: vertical / frontal  
 Hnè: vertical / frontal  
 Hoddu: vertical / frontal  
 Hommel: oblique / half lateral  
 Horagai: oblique / half lateral  
 Horn: horizontal / lateral  
 Hourglass drum: vertical / frontal  
 Huagu: vertical / frontal  
 Huagu: vertical / half lateral  
 Huangnigu: vertical / frontal  
 Huchet: horizontal / lateral  
 Hudko: vertical / frontal  
 Hunting horn: horizontal / lateral  
 Huqin: vertical / frontal  
 Hurdy-gurdy: oblique / half lateral  
 Huruk: vertical / frontal

## I

Ifambu: horizontal / frontal  
 Ikembe: oblique / half lateral  
 Ilimba: oblique / half lateral  
 Imzad: vertical / frontal  
 Inanga: oblique / half lateral  
 Insimbi: oblique / half lateral  
 Inventionshorn: horizontal / lateral  
 Irish harp: vertical / half lateral  
 Irregular violin: vertical / frontal

## J

Jaltarang: vertical / frontal  
 Jarana: vertical / frontal  
 Jengglong: vertical / frontal  
 Jew's harp: horizontal / dorsal  
 Jinghu: vertical / frontal  
 Jingle: oblique / half lateral

## K

Ka: vertical / frontal  
 Kabaro: vertical / frontal  
 Kaburu: vertical / frontal  
 Kacapi: oblique / half lateral  
 Kaccapi vina: vertical / frontal  
 Kagurabue: horizontal / frontal  
 Kahala: horizontal / lateral  
 Kakko: oblique / half lateral  
 Kalangu: vertical / frontal  
 Kalimba: oblique / half lateral  
 Kamaica: vertical / frontal  
 Kamanche: vertical / frontal  
 Kambre: vertical / frontal  
 Kani: vertical / frontal  
 Kanjira: vertical / half lateral  
 Kantele: oblique / half lateral  
 Kara: vertical / frontal  
 Kara: vertical / frontal  
 Karna: horizontal / lateral  
 Kartal: horizontal / lateral  
 Kasar: vertical / frontal  
 Kasat: horizontal / lateral  
 Kasso: vertical / frontal  
 Kaval: vertical / frontal  
 Kayagum: oblique / half lateral  
 Kazoo: horizontal / lateral  
 Kementses: vertical / frontal  
 Kempul: vertical / frontal  
 Ken: vertical / frontal  
 Ken bau: vertical / frontal  
 Ken be: vertical / lateral  
 Ken doi: vertical / frontal  
 Ken meo: horizontal / lateral  
 Ken mot: vertical / frontal  
 Kena: vertical / frontal  
 Kendang: oblique / half lateral  
 Kenong: vertical / frontal  
 Kenyen: oblique / half lateral  
 Kettledrum: vertical / frontal  
 Ketuk: vertical / frontal  
 Keyed bugle: horizontal / lateral  
 Keyed trumpet: horizontal / lateral  
 Khaen: vertical / lateral  
 Khalam: vertical / frontal  
 Khanjari: vertical / half lateral  
 Khartal: horizontal / lateral  
 Khlui: vertical / frontal  
 Khlyu: vertical / frontal  
 Khol: oblique / half lateral  
 Khong mong: vertical / frontal  
 Khuur: vertical / frontal  
 Kiangl: vertical / frontal  
 Kidi: vertical / frontal  
 Kili: vertical / frontal  
 Kin: oblique / half lateral  
 Kinanda: oblique / half lateral  
 Kinnari vina: vertical / frontal  
 Kiringi: oblique / half lateral

Kisaanj: oblique / half lateral  
 Kisfejes citera: oblique / half lateral  
 Kissar: vertical / frontal  
 Kit: vertical / frontal  
 Kkwaenggwari: vertical / frontal  
 Kokyu: vertical / frontal  
 Komabue: horizontal / frontal  
 Komun'go: horizontal / frontal  
 Komuz: vertical / frontal  
 Kopuz: vertical / frontal  
 Kora: vertical / frontal  
 Kori: oblique / half lateral  
 Koto: oblique / half lateral  
 Kotsuzumi: vertical / frontal  
 Krajappi: vertical / frontal  
 Krar: vertical / frontal  
 Kudu: vertical / frontal  
 Kundi: oblique / half lateral  
 Kundye: vertical / frontal  
 Kyi-waing: vertical / frontal  
 Kyi-zi: vertical / frontal

## L

Laba: horizontal / lateral  
 Lamellaphone: oblique / half lateral  
 Launeddas: vertical / frontal  
 Legwegwe: vertical / frontal  
 Ligombo: oblique / half lateral  
 Likembe: oblique / half lateral  
 Limonaire: vertical / frontal  
 Lira: vertical / frontal  
 Lira da braccio: vertical / frontal  
 Lira organizzata: oblique / half lateral  
 Lirone: vertical / frontal  
 Lithophone: vertical / frontal  
 Lituus: vertical / lateral  
 Longdi: horizontal / frontal  
 Lu: vertical / frontal  
 Ludaya: horizontal / frontal  
 Lukombe: oblique / half lateral  
 Luo: vertical / frontal  
 Luogu: vertical / half lateral  
 Lur: vertical / lateral  
 Lutar: vertical / frontal  
 Lute: vertical / frontal  
 Lute-guitar: vertical / frontal  
 Lute-harpsichord: oblique / half lateral  
 Lutheal: oblique / half lateral  
 Lyra: vertical / frontal  
 Lyra glockenspiel: vertical / frontal  
 Lyre: vertical / frontal  
 Lyre guitar: vertical / frontal  
 Lyre piano: vertical / frontal  
 Lyre-bandurria: vertical / frontal

## M

Machete: vertical / frontal  
 Madaku: oblique / half lateral  
 Madimba: oblique / half lateral  
 Madiumba: oblique / half lateral  
 Malakat: horizontal / lateral  
 Mamokhorong: vertical / frontal  
 Mandole: vertical / frontal  
 Mandolin: vertical / frontal  
 Mandoloncelle: vertical / frontal  
 Mandolone: vertical / frontal  
 Mandore: vertical / frontal

Mandore: vertical / frontal  
 Manjira: horizontal / frontal  
 Manza: horizontal / lateral  
 Maracas: vertical / frontal  
 Marimba: oblique / half lateral  
 Marimba: horizontal / frontal  
 Masenqo: vertical / frontal  
 Masul: vertical / frontal  
 Mattauphone: oblique / half lateral  
 Mazhar: vertical / half lateral  
 Mbejn: vertical / frontal  
 Mbila: oblique / half lateral  
 Mbira: oblique / half lateral  
 Mbombu: vertical / frontal  
 Mechanical clock: vertical / frontal  
 Mechanical harpsichord: oblique / half lateral  
 Mechanical organ: vertical / frontal  
 Mechanical pianoforte: oblique / half lateral  
 Mellophone: horizontal / lateral  
 Mellotron: horizontal / frontal  
 Melodeon: oblique / half lateral  
 Melodica: vertical / frontal  
 Melophone: oblique / half lateral  
 Mendzan: oblique / half lateral  
 Metallophone: oblique / half lateral  
 Midi instrument: horizontal / frontal  
 Mi-gyaung: oblique / half lateral  
 Mijwiz: vertical / frontal  
 Milanese mandolin: vertical / frontal  
 Miriliton: oblique / half lateral  
 Mishiba: vertical / frontal  
 Mizmar: vertical / frontal  
 Modeku: oblique / half lateral  
 Mokita: vertical / frontal  
 Mokkin: oblique / half lateral  
 Mokugyo: vertical / frontal  
 Monochord: oblique / half lateral  
 Mouth bow: vertical / lateral  
 Mouth organ: vertical / lateral  
 Mrdanga: oblique / half lateral  
 Mukhavina: vertical / frontal  
 Mukupiela: vertical / frontal  
 Murali: horizontal / frontal  
 Murcang: horizontal / dorsal  
 Musette: vertical / frontal  
 Musette: vertical / half lateral  
 Musical bow: vertical / lateral  
 Musical bowl: vertical / frontal  
 Musical box: vertical / half lateral  
 Musical glasses: horizontal / frontal  
 Musical saw: vertical / lateral  
 Mute cornett: vertical / frontal  
 Muyu: oblique / half lateral  
 Mvet: horizontal / lateral  
 Mwanzi: vertical / frontal  
 Myonga: oblique / half lateral

## N

Nafir: horizontal / lateral  
 Nagara: vertical / frontal  
 Nagasvaram: 9.3.5 vertical / frontal  
 Nail violin: horizontal / frontal  
 Nakers: vertical / frontal  
 Nangara: vertical / frontal  
 Naqqara: vertical / frontal  
 Narsiga: horizontal / lateral  
 Natural cornet: horizontal / lateral

Natural trumpet: horizontal / lateral  
 Naturhorn: horizontal / lateral  
 Nay: vertical / frontal  
 Ndere: vertical / frontal  
 Ndingidi: vertical / frontal  
 Ndjembo: oblique / half lateral  
 Ndongo: vertical / frontal  
 Neapolitan mandolin: vertical / frontal  
 Nedomu: oblique / half lateral  
 Nembongo: horizontal / lateral  
 Neocor: vertical / lateral  
 Ney-e anban: vertical / half lateral  
 Ngoma: vertical / frontal  
 Ngombi: oblique / half lateral  
 Ngonge: vertical / frontal  
 Nguru: vertical / frontal  
 Nkoko: vertical / frontal  
 Nkoni: vertical / frontal  
 Nokan: horizontal / frontal  
 Nonga: vertical / frontal  
 Northumbrian pipe: vertical / half lateral  
 Nose flute: horizontal / frontal  
 Notched flute: vertical / frontal  
 Nupur: vertical / frontal  
 Nyastaranga: vertical / frontal  
 Nyckelharpa: vertical / frontal  
 Nyo: vertical / frontal

## O

Oboe: vertical / frontal  
 Oboe da caccia: vertical / half lateral  
 Oboe d'amore: vertical / frontal  
 Ocarina: horizontal / lateral  
 Octavin: vertical / half lateral  
 Octobass: vertical / frontal  
 Odaiko: oblique / half lateral  
 Oliphant: horizontal / lateral  
 Ombi: oblique / half lateral  
 Omnitonic horn: horizontal / lateral  
 Ondes Martenot: horizontal / frontal  
 Ondioline: horizontal / frontal  
 One-string fiddle: vertical / frontal  
 Ophicleide: vertical / lateral  
 Ophimonocleide: vertical / lateral  
 Orchestrion: vertical / frontal  
 Organ: vertical / frontal  
 Organistrum: oblique / half lateral  
 Orpharion: vertical / frontal  
 Orpharion: vertical / frontal  
 Orpheon: oblique / half lateral  
 Orphica: horizontal / frontal  
 Otsuzumi: oblique / half lateral  
 O-zi: vertical / frontal

## P

Paiban: vertical / frontal  
 Paixiao: vertical / frontal  
 Pakhavaj: oblique / half lateral  
 Pandeiro: vertical / half lateral  
 Panduri: vertical / frontal  
 Pang: horizontal / lateral  
 Panpipe: vertical / frontal  
 Para: oblique / half lateral  
 Penny whistle: vertical / frontal  
 Penorcon: vertical / frontal  
 Percussion stick: horizontal / lateral  
 Percussion tubes: vertical / frontal

Phagotus: vertical / frontal  
 Phorminx: vertical / frontal  
 Pi: vertical / frontal  
 Pi phat: horizontal / frontal  
 Pianet: horizontal / frontal  
 Pianino: vertical / frontal  
 Piano à pédailler: oblique / half lateral  
 Piano organise: vertical / frontal  
 Piano table: horizontal / frontal  
 Pianoforte: oblique / half lateral  
 Piano-guitar: vertical / frontal  
 Piano-harp: vertical / frontal  
 Pianola: horizontal / frontal  
 Picco pipe: vertical / frontal  
 Piccolo flute: horizontal / frontal  
 Pifano: horizontal / frontal  
 Piffaro: vertical / frontal  
 Pinak: vertical / lateral  
 Pipa: vertical / frontal  
 P'iri: vertical / frontal  
 Pitu: vertical / frontal  
 Piva: vertical / half lateral  
 Player piano: horizontal / frontal  
 Pluriarc: oblique / half lateral  
 Poikilorgue: horizontal / frontal  
 Polyphon: oblique / half lateral  
 Popgun: oblique / half lateral  
 Portable harpsichord: oblique / half lateral  
 Portative organ: vertical / frontal  
 Portuguese guitar: vertical / frontal  
 Positive organ: vertical / frontal  
 Post horn: horizontal / lateral  
 Psaltery, asymmetrical: oblique / half lateral  
 Psaltery, symmetrical: horizontal / frontal  
 Puk: vertical / half lateral  
 Pungi: vertical / frontal  
 Pu-ti-pu: vertical / frontal  
 Puertoorino: vertical / frontal  
 Pyramid pianoforte: vertical / frontal  
 Pyrophone: vertical / frontal

## Q

Qanun: oblique / half lateral  
 Qarqab: horizontal / frontal  
 Qasaba: vertical / frontal  
 Qin: oblique / half lateral  
 Qing: vertical / frontal  
 Qobuz: vertical / frontal  
 Qoshnai: vertical / frontal  
 Quinticlave: vertical / lateral  
 Quinton: vertical / frontal  
 Quwaytara: vertical / frontal

## R

Rabab: vertical / frontal  
 Rababa: vertical / frontal  
 Rabel: vertical / frontal  
 Racket: vertical / frontal  
 Raft zither: horizontal / frontal  
 Rammana: vertical / half lateral  
 Ranat: oblique / half lateral  
 Ratchet: horizontal / lateral  
 Rattle with handle: vertical / frontal  
 Rattle without handle: oblique / half lateral  
 Ravanhattha: vertical / frontal  
 Rebec: vertical / frontal  
 Recorder: vertical / frontal

Reed horn: horizontal / lateral  
 Reed organ: horizontal / frontal  
 Reedpipe: vertical / frontal  
 Regal: oblique / half lateral  
 Rgya-gling: vertical / frontal  
 Riqq: vertical / half lateral  
 Rkang-gling: horizontal / lateral  
 Rnga: vertical / half lateral  
 Rol-mo: horizontal / lateral  
 Rondador: vertical / frontal  
 Rothophone: vertical / half lateral  
 Rozhok: vertical / frontal  
 Ruan: vertical / frontal  
 Russian bassoon: vertical / frontal  
 Ruudga: vertical / frontal  
 Ryuteki: horizontal / frontal

## S

Sackbut: horizontal / frontal  
 Sackbut: horizontal / lateral  
 Saenghwang: vertical / lateral  
 Sahnai: vertical / frontal  
 Sajat: horizontal / lateral  
 Sakara: vertical / half lateral  
 Salpinx: vertical / frontal  
 Saluang: vertical / frontal  
 Sampler: horizontal / frontal  
 Sanasel: vertical / frontal  
 Sanfona: oblique / half lateral  
 Sanj: horizontal / frontal  
 Sankh: oblique / half lateral  
 Sanshin: vertical / frontal  
 Santur: oblique / half lateral  
 Sanxian: vertical / frontal  
 Sanza: oblique / half lateral  
 Sao: horizontal / frontal  
 Saradiya vina: vertical / frontal  
 Sarangi: vertical / frontal  
 Sarasvati vina: vertical / frontal  
 Sarinda: vertical / frontal  
 Sarod: vertical / frontal  
 Saron barung: oblique / half lateral  
 Saron demung: oblique / half lateral  
 Saron panerus: oblique / half lateral  
 Sarong: vertical / frontal  
 Sarrusphone: vertical / lateral  
 Sarunai: vertical / frontal  
 Satara: vertical / frontal  
 Saung-gauk: oblique / half lateral  
 Saxhorn: vertical / lateral  
 Saxophone: vertical / half lateral  
 Saxotromba: vertical / lateral  
 Saz: vertical / frontal  
 Ssub-chal: horizontal / lateral  
 Schreyerpfeife: horizontal / frontal  
 Scraped stick: vertical / frontal  
 Scraped vessel: horizontal / lateral  
 Scraper: vertical / lateral  
 Se: oblique / half lateral  
 Sekere: vertical / frontal  
 Seljefloyte: horizontal / frontal  
 Serpent: vertical / frontal  
 Serpent Forveille: vertical / frontal  
 Serpentcleide: vertical / frontal  
 Sesheh: vertical / frontal  
 Setar: vertical / frontal  
 Sgar dham: vertical / frontal  
 Sgra-snyan: vertical / frontal

Shabbaba: vertical / frontal  
 Shagu: vertical / frontal  
 Shakuhachi: vertical / frontal  
 Shamisen: vertical / frontal  
 Shawn: vertical / frontal  
 Sheng: vertical / lateral  
 Sheypur: horizontal / lateral  
 Shilla-shilla: vertical / frontal  
 Shinobue: horizontal / frontal  
 Shkashek: horizontal / frontal  
 Sho: vertical / lateral  
 Shofar: horizontal / lateral  
 Shoko: vertical / frontal  
 Shuangqing: vertical / frontal  
 Shuiniao: vertical / frontal  
 Side drum: vertical / frontal  
 Sigu nihu: vertical / frontal  
 Sihu: vertical / frontal  
 Sil-snyan: horizontal / lateral  
 Simbing: oblique / half lateral  
 Sinh tien: oblique / half lateral  
 Sistrum: vertical / frontal  
 Sitar: vertical / frontal  
 Sitari: horizontal / frontal  
 Sixian: vertical / frontal  
 Sizzle cymbal: horizontal / lateral  
 Sleigh bell, mounted: vertical / frontal  
 Slentem: oblique / half lateral  
 Slensto: oblique / half lateral  
 Slide flute: horizontal / frontal  
 Slide trumpet: horizontal / lateral  
 Slit drum: vertical / frontal  
 Small pipe: vertical / half lateral  
 So duang: vertical / frontal  
 So sam sai: vertical / frontal  
 So u: vertical / frontal  
 Sock cymbal: vertical / frontal  
 Sodina: vertical / frontal  
 Sogo: vertical / frontal  
 Solovox: horizontal / frontal  
 Sonorophone: vertical / lateral  
 Sopilka: vertical / frontal  
 Soprano recorder: vertical / frontal  
 Soprano bugle: horizontal / lateral  
 Soprano crumhorn: vertical / half lateral  
 Soprano flugelhorn: horizontal / lateral  
 Soprano saxhorn: vertical / lateral  
 Soprano saxophone: vertical / frontal  
 Soprano trombone: horizontal / lateral  
 Sordun: vertical / frontal  
 Sousaphone: vertical / frontal  
 Spinet: oblique / half lateral  
 Square pianoforte: horizontal / frontal  
 Sralai: vertical / frontal  
 Sruti-box: oblique / half lateral  
 Steel drum: vertical / frontal  
 Still shawm: vertical / frontal  
 Straight cornett: vertical / frontal  
 String drum: vertical / frontal  
 Sudrophone: vertical / lateral  
 Suffara: vertical / frontal  
 Suling: vertical / frontal  
 Sultana: vertical / frontal  
 Suona: vertical / frontal  
 Surbahar: vertical / frontal  
 Surmandal: oblique / half lateral  
 Surnay: vertical / frontal  
 Surune: vertical / frontal

Suzu: vertical / frontal  
 Svirel: vertical / frontal  
 Swanee whistle: vertical / frontal  
 Swanee-sax: vertical / half lateral  
 Swanga: vertical / frontal  
 Symphonium: oblique / half lateral  
 Synclavier: horizontal / frontal  
 Synthesizer: horizontal / frontal  
 Syrinx: vertical / frontal

**T**

Tabl: oblique / half lateral  
 Tabla: vertical / frontal  
 Tablak: vertical / frontal  
 Taegum: horizontal / frontal  
 Taga: vertical / frontal  
 Taiko: vertical / frontal  
 Talempong: horizontal / frontal  
 Tam am la: vertical / frontal  
 Tama: vertical / frontal  
 Tambora: oblique / half lateral  
 Tambourin de Provence: vertical / frontal  
 Tambourine: vertical / half lateral  
 Tambura: vertical / frontal  
 Tamtam: vertical / frontal  
 Tanbur: vertical / frontal  
 Tangent piano: oblique / half lateral  
 Tanggu: vertical / frontal  
 Taogu: oblique / half lateral  
 Tapan: oblique / half lateral  
 Tar: vertical / frontal  
 Tar: vertical / half lateral  
 Tarogato: vertical / frontal  
 Tarol: horizontal / frontal  
 Tarompet: horizontal / lateral  
 Tasa: vertical / frontal  
 Tbel: oblique / half lateral  
 Tebushul: vertical / frontal  
 Telharmonium: horizontal / frontal  
 Temple block: oblique / half lateral  
 Tenor bugle: horizontal / lateral  
 Tenor cor: horizontal / lateral  
 Tenor crumhorn: vertical / half lateral  
 Tenor drum: vertical / frontal  
 Tenor dulcian: vertical / frontal  
 Tenor new violin: vertical / frontal  
 Tenor oboe: vertical / frontal  
 Tenor recorder: vertical / frontal  
 Tenor rothophone: vertical / half lateral  
 Tenor saxophone: vertical / half lateral  
 Tenor shawm: vertical / frontal  
 Tenor trombone: horizontal / lateral  
 Tenor viol: vertical / frontal  
 Tenor violin: vertical / frontal  
 Tenora: vertical / frontal  
 Tenoroon: vertical / frontal  
 Thali: horizontal / frontal  
 Thanh la: vertical / frontal  
 Theorbo: vertical / frontal  
 Theremin: vertical / frontal  
 Third flute: horizontal / frontal  
 Thon: vertical / frontal  
 Tibia: vertical / frontal  
 Tikara: vertical / frontal  
 Tilinca: vertical / frontal  
 Timbrh: oblique / half lateral  
 Timila: vertical / frontal

Ting-ting-shags: horizontal / lateral  
 Tobol: vertical / frontal  
 Tomba: vertical / frontal  
 Tong: horizontal / dorsal  
 Transverse flute: horizontal / frontal  
 Träskofiol: vertical / frontal  
 Trautonium: vertical / frontal  
 Treble recorder: vertical / frontal  
 Treble cornett: vertical / frontal  
 Treble shawm: vertical / frontal  
 Treble viol: vertical / frontal  
 Triangle: vertical / frontal  
 Triple clarinet: vertical / frontal  
 Tritonikon: vertical / lateral  
 Trombita: horizontal / lateral  
 Trombone: horizontal / lateral  
 Trompe de Lorraine: horizontal / lateral  
 Trong com: vertical / frontal  
 Trumpet: horizontal / lateral  
 Trumpet marine: vertical / frontal  
 Tsimbi: oblique / half lateral  
 Tsuridaiko: vertical / frontal  
 Tuba: vertical / lateral  
 Tuba curva: vertical / lateral  
 Tuba-Dupré: vertical / frontal  
 Tubaphone: vertical / frontal  
 Tube zither: horizontal / lateral  
 Tubilattes: vertical / frontal  
 Tubular bell: vertical / frontal  
 Tulum: vertical / half lateral  
 Tumba: vertical / frontal  
 Tumbadora: vertical / frontal  
 Tuohitorvi: horizontal / lateral  
 Turhi: horizontal / lateral  
 Turi: horizontal / lateral  
 Turkish crescent: vertical / lateral  
 Txanbelta: vertical / frontal  
 Txirula: vertical / frontal  
 Txistu: vertical / frontal  
 Tyepondo-pinge: vertical / frontal  
 Tympanon: oblique / half lateral

## U

Ud: vertical / frontal  
 Uganda drum: vertical / frontal  
 Ugbubhu: vertical / lateral  
 Ugbubhu: vertical / lateral  
 Ukulele: vertical / frontal  
 Umakhweyana: vertical / lateral  
 Union pipe: vertical / half lateral  
 UPIC: horizontal / frontal  
 Upright pianoforte: vertical / frontal

## V

Valiha: horizontal / lateral  
 Valimba: oblique / half lateral  
 Valve horn: horizontal / lateral  
 Valve trumpet: vertical / lateral  
 Vamsa: horizontal / frontal  
 Variable tension hourglass drum: oblique / half lateral  
 Veuze: vertical / half lateral  
 Vibraphone: oblique / half lateral  
 Vihuela: vertical / frontal  
 Vina: oblique / half lateral  
 Viol: vertical / frontal

Viol double bass: vertical / frontal  
 Viola: vertical / frontal  
 Viola alta: vertical / frontal  
 Viola arpa: vertical / half lateral  
 Viola bastarda: vertical / frontal  
 Viola da gamba: vertical / frontal  
 Viola d'amore: vertical / frontal  
 Viola pomposa: vertical / frontal  
 Viola: vertical / frontal  
 Violin: vertical / frontal  
 Violin d'amore: vertical / frontal  
 Violin Midi: vertical / frontal  
 Violoncello: vertical / frontal  
 Violone: vertical / frontal  
 Virginal: horizontal / frontal

## W

Wagner tuba: vertical / lateral  
 Wagon: horizontal / frontal  
 Wambee: oblique / half lateral  
 Waniguchi: vertical / frontal  
 Wankara: vertical / frontal  
 Wasamba: vertical / frontal  
 Washboard: vertical / frontal  
 Washint: vertical / frontal  
 Water organ: vertical / frontal  
 Whip: oblique / half lateral  
 Whistle: vertical / frontal  
 Woodblock: oblique / half lateral

## X

Xiao: vertical / frontal  
 Xirularru: vertical / half lateral  
 Xizambi: vertical / lateral  
 Xun: vertical / frontal  
 Xylophone: oblique / half lateral  
 Xylophone with approx. equal length of bars: horizontal / lateral

## Y

Yanggum: oblique / half lateral  
 Yangqin: horizontal / frontal  
 Yaogu: vertical / frontal  
 Yaoling: vertical / frontal  
 Yaqin: oblique / half lateral  
 Yehu: vertical / frontal  
 Yotsudake: horizontal / lateral  
 Yu: oblique / half lateral  
 Yueqin: vertical / frontal  
 Yunluo: vertical / frontal

## Z

Zampogna: vertical / half lateral  
 Zamr: vertical / frontal  
 Zarb: vertical / frontal  
 Zeze: horizontal / frontal  
 Zhangu: vertical / frontal  
 Zheng: oblique / half lateral  
 Zhong: vertical / frontal  
 Zhonghu: vertical / frontal  
 Zither: oblique / half lateral  
 Zuffolo: vertical / frontal  
 Zukra: vertical / half lateral  
 Zummarra: vertical / frontal  
 Zurna: vertical / frontal

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