

**K-REV: The KNIGHT-REVISION OF HORNBOSTEL-SACHS**  
**A system for musical instrument classification**  
by Roderic Knight, Oberlin College, © 2015

Organology, or the scientific study of musical instruments, has ancient roots. In China, a system of classification known as the *pa yin* or “eight sounds” was devised in the third millennium BCE. It was based on eight materials used in instrument construction (but not necessarily in sound production) and allied to other physical and metaphysical phenomena. More recently, but still in ancient times, the Indian sage Bharata outlined in his *Natyashastra* (ca. 200 CE) a classification based on how the sound is produced: by blowing (*sushira*), setting a string in motion (*tata*), hitting a stretched skin (*avanaddha*), or hitting something solid (*ghana*). This system endures as a worldwide phenomenon today because Victor Mahillon adopted it for his catalog of the instruments in the Brussels Conservatory museum in the 19th century, and because his system was picked up in turn by Erich M. von Hornbostel and Curt Sachs in producing their seminal *Systematik der Musikinstrumente* (Classification of Musical Instruments) in 1914.

Hornbostel and Sachs sought to universalize the Mahillon catalog by developing a hierarchy of terms that could encompass all the methods of sound production known to humankind. They used three of Mahillon’s terms: **aerophone**, for the “winds and brass” of the orchestra and all other instruments that produce a sound by exciting the air directly; **chordophone**, for all stringed instruments (including the keyboards); and **membranophone** for drums. Hornbostel and Sachs replaced Mahillon’s fourth term, autophone (for instruments whose body itself, or some part of the body, produces the sound – the Indian *ghana* type), with their newly coined term, **idiophone**, to avoid the ambiguous implication that an “autophone” might sound by itself.

In Hornbostel-Sachs, an instrument is assigned a number. It may be a single digit, such as 1, indicating nothing more than the broad class, such as idiophone. More typically, an H-S number might have 3 to 6 digits, or as many as 9 or 10 (separated every three by a decimal point), to provide the degree of specificity needed to distinguish one instrument from another. The numbering method is based on the Dewey Decimal System, which was in common use by libraries at the time the system was devised.

Although Hornbostel-Sachs is the most widely used method for classifying instruments, applied to instrument collections worldwide, translated into English in 1961, and taught regularly, it is also fraught with problems that have been tackled by many scholars over the century since its introduction. The system now includes a fifth term, coined by Francis W. Galpin in 1937, **electrophone**. The most current version of H-S, prepared in 2011 by the MIMO Consortium (Musical Instrument Museums Online), is available at: <http://network.icom.museum/cimcim/resources/classification-of-musical-instruments>.

The establishment in 2008 of the Roderic C. Knight Musical Instrument Collection at Oberlin College served as a catalyst for a new approach. It is called the Knight-Revision of Hornbostel-Sachs, or K-Rev for short. The four H-S terms are retained, as is the numbering system, but because the internal subdivisions of the classes have been largely reworked, the numbers do not match the H-S numbers. To assure the two are never confused, K-Rev numbers begin with a letter, as follows:

- Y** for Idiophone (Y is used for I to avoid resembling a Roman numeral I) – a solid or hollow body produces the sound
- M** for Membranophone – a stretched membrane or diaphragm produces the sound
- C** for Chordophone – a stretched string produces the sound
- A** for Aerophone – blowing air into an object or moving it through the air produces the sound
- E** for Electrophone – electric or electronic circuits produce the sound

The RCK Collection may be used to study K-Rev. A K-Rev number has been assigned to each instrument. An overview of the system is presented below. To access a downloadable pdf of the complete 44-page document, go here: <http://www.oberlin.edu/faculty/rknight/Organology/KNIGHTREVISION.html>

**IDIOPHONE**

**Y1 Concussion**

- 11 Plaque
- 12 Bar
- 13 Dish
- 14 Vessel

**Y2 Struck**

- 21 Plaque
- 22 Bar
- 23 Vessel

**Y3 Stamped**

- 31 Globe
- 32 Tube

**Y4 Shaken**

- 41 Vessel
- 42 Sliding
- 43 Solid
- 43.1 Sheet
- 43.2 Spring
- 44 Concussion
- 45 Sympathetic

**Y5 Scraped**

- 51 Organic  
(wood, gourd)
- 52 Manufact'd  
(metal, cloth,  
sandpaper)

**Y6 Friction**

- 61 Solid
- 62 Vessel

**Y7 Plucked**

- 71 Frame
- 72 Board

**Y8 Blown**

- 81 Wood
- 82 Metal

**Y9 Deformed**

- 91 Diaphragm
- 92 Blade

**MEMBRANOPHONE**

**M1 Struck**

**11 One head, open**

- 11.1 Vessel**
- 11.11 Cylinder
- 11.12 Cone
- 11.13 Waisted
- 11.14 Barrel
- 11.15 Goblet
- 11.16 Vase
- 11.17 (other shapes)

**11.2 Frame**

- 11.21 Circular
- 11.22 Polygonal

**12 One head, closed**

**12.1 Deep (vessel)**

- 12.11 Cylinder
- 12.12 Kettle
- 12.13 Barrel
- 12.2 Shallow (frame)**

**13 Two heads**

- 13.1 Vessel**
- 13.11 Cylinder
- 13.12 Cone
- 13.13 Hourglass
- 13.14 Barrel
- 13.15 Ang. Barrel
- 13.2 Frame**

**M2 Shaken**

**21 External strikers**

- 21.1 Opposed  
hemispheres
- 21.2 Hourglass
- 21.3 Frame

**22 Internal strikers**

**M3 Friction**

- 31 One head
- 32 Two heads

**M4 Sympathetic**

(*mirliton*)

**CHORDOPHONE**

**C1 Variable tension**

- 11 No neck
- 12 Single neck
- 13 Forked neck

**C2 Musical bow**

- 21 Mouth resonated
- 22 Gourd resonated

**C3 Pluriarc**

**C4 Harp**

**41 Strings-over**

- 41.1 Forked
- 41.2 Spike
- 41.21 Curved neck
- 41.22 Straight neck  
(Bridge harp)

**42 Strings-in**

- 42.1 Arched
- 42.2 Angled

**C5 Zither**

- 51 Stick or bar
- 52 Tube
- 53 Raft
- 54 Board
- 55 Box
- 56 Trough
- 57 Harp zither
- 58 Frame

**C6 Lute**

**61 Plucked**

- 61.1 One piece
- 61.2 Multi-part
- 61.21 Neck attached
- 61.22 Spike
- 61.23 Half-spike

**62 Bowed**

- 62.1 One piece
- 62.2 Multi-part
- 62.21 Neck attached
- 62.22 Spike
- 62.23 Half-spike

**C7 Lyre**

- 71 Bowl
- 72 Box

**AEROPHONE**

**A1 Ambient (Free)**

- 11 Slicing
- 12 Beating (bull roarer)
- 13 Whip (sonic boom)

**A2 Blown**

**21 Open**

**21.1 Edge (flute)**

- 21.11 Vessel**
- 21.111 No duct
- 21.112 Duct

**21.12 Vertical**

- 21.121 No duct
- 21.122 Duct

**21.13 Oblique**

**21.14 Transverse**

**21.2 Chamber duct**

- 21.21 Simple
- 21.22 Vented

**21.3 Corrugated pipe**

**21.4 Siren (pulsated)**

**22 Reed**

**22.1 Free (Hard)**

**22.2 Beating (Soft)**

**22.21 Normally open**

**22.211 Conical bore**

- 22.211.1 Single reed
- 22.211.2 Double reed

**22.212 Cylindrical bore**

- 22.212.1 Single reed
- 22.212.2 Double reed
- 22.212.3 Free on pipe

**22.213 Mouthpiece only**

**22.22 Normally closed**

- 22.221 Split or crushed
- 22.222 Membrano-reed

**22.3 Ribbon Reed**

**23 Lip reed**

**23.1 Narrow compass**

- 23.11 Fixed length
- 23.12 Variable length

**23.2 Wide compass**

- 23.21 Fixed length
- 23.22 Variable length  
(fingerhole, slide, valve)

**A3 Plosive**

- 31 Closed
- 32 Open