

AN INTRODUCTION TO THE KNIGHT SYSTEM
FOR MUSICAL INSTRUMENT CLASSIFICATION
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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* 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 from two to nine or more digits (separated every three by a decimal point), to provide the degree of specificity needed to distinguish it from another instrument. The numbering method is based on the Dewey Decimal System, in use by libraries at the time.

Although Hornbostel-Sachs is the most widely used method for classifying instruments, applied by museums 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. With this musical instrument collection, the latest reworking of Hornbostel-Sachs is introduced. It is called the Knight System, and it grew, as did Mahillon's, out of cataloging the collection. The four H-S terms are retained, with a fifth (coined by Francis W. Galpin in 1937), **electrophone**, added. In the Knight System, instruments are assigned a number, 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, the K-S number begins 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 – the air itself is set in motion
- E** for Electrophone – electric or electronic circuits produce the sound

A Knight System number has been applied to each instrument in the collection. An overview of the system is presented below. For the complete system, see the KNIGHTSYSTEM.pdf.

Overview of the Knight System for Musical Instrument Classification

Y Idiophones

- Y1 Concussion
 - 1 Plaque
 - 2 Bar
 - 3 Dish
 - 4 Vessel
- Y2 Struck
 - 1 Plaque
 - 2 Bar
 - 3 Vessel
- Y3 Stamped
 - 1 Solid
 - 2 Globe
 - 3 Tube
 - 4 Split
- Y4 Shaken
 - 1 Vessel
 - 2 Sliding
 - 3 Sheet
 - 4 Concussion
 - 5 Sympathetic
- Y5 Scraped
 - 1 Organic
 - 1 Wood
 - 2 Gourd
 - 2 Manufactured
 - 1 Metal
 - 2 Cloth
 - 3 Sandpaper
- Y6 Friction
 - 1 Solid
 - 2 Vessel
- Y7 Plucked
 - 1 Frame
 - 2 Board
- Y8 Blown

M Membranophones

- M1 Struck
 - 1 One head, open
 - 1 Vessel
 - 2 Frame
 - 2 One head, closed
 - 1 Deep
 - 2 Shallow

- M13 Two heads
 - 1 Vessel
 - 2 Frame
- M2 Shaken
 - 1 Opposed hemispheres
 - 2 Hourglass
 - 3 Frame
- M3 Friction
 - 1 One head
 - 2 Two heads
- M4 Sympathetic

C Chordophones

- C1 Variable tension
 - 1 No neck
 - 2 Single neck
 - 3 Forked neck
- C2 Musical bow
 - 1 Mouth resonated
 - 2 Gourd resonated
- C3 Pluriarc or bow-lute
- C4 Harp
 - 1 Strings-over
 - 1 Forked
 - 2 Spike
 - 1 Curved neck
 - 2 Straight neck (Bridge harp)
 - 2 Strings-in
 - 1 Arched
 - 2 Angled
- C5 Zither
 - 1 Stick
 - 2 Tube
 - 3 Raft
 - 4 Trough
 - 5 Box
 - 6 Harp zither
 - 7 Frame
- C6 Lute
 - 1 Plucked
 - 1 One piece
 - 2 Multi-part
 - 2 Bowed
 - 1 One piece
 - 2 Multi-part
- C7 Lyre

A Aerophones

- A1 Ambient air
 - 1 Beating
 - 2 Slicing
 - 3 Ribbon
- A2 Enclosed
 - 1 Flute
 - 1 Vessel flute
 - 1 No duct
 - 2 Duct
 - 3 Duct + chamber
 - 2 Vertical flute
 - 1 No duct
 - 2 Duct
 - 3 Oblique flute
 - 4 Transverse flute
 - 5 Double-layer whistle
 - 2 Reed
 - 1 Free (hard) reed
 - 1 Mouth blown
 - 2 Bellows blown
 - 3 Transverse
 - 2 Beating (soft) reed
 - 1 Conical bore
 - 1 Single reed
 - 2 Double reed
 - 2 Cylindrical bore
 - 1 Single reed
 - 2 Double reed
 - 3 Multiple reed
 - 3 Horn (lip-reed)
 - 1 Limited register
 - 1 Fixed length
 - 2 Variable length
 - 2 Multiple register
 - 1 Fixed length
 - 2 Variable length
 - 1 Fingerhole
 - 2 Slide
 - 3 Valve
 - 4 Corrugated pipe
 - 1 Twirled
 - 2 Blown
- A3 Plosive aerophone
 - 1 Open
 - 2 Enclosed