

Jianpu Musical Notation (a Wiki book)

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The **numbered musical notation** (simplified Chinese: 简谱; traditional Chinese: 簡譜; pinyin: *jiǎnpǔ*; literally: “simplified notation”), is a musical notation system widely used in music publications in China. Not to be confused with the **integer notation**. It dates back to the system designed by **Pierre Galin**, known as **Galín-Paris-Chevé** system. It is comparable to the **Gongche notation** from the Tang Dynasty.

It is also known as *Ziffersystem*, meaning “number system” or “**cipher system**” in German. It should be noticed that some other unrelated musical notation systems are also called **cipher notations**.

The same system or very similar systems are used to some extent in some other countries such as Japan (with 7th being si), Indonesia, Australia, Ireland, the United Kingdom, the United States and English-speaking Canada.

1 Numbered notation described

1.1 Musical notes

Numbers 1 to 7 represent the **musical notes** (more accurately the **scale degrees**). They always correspond to the **diatonic major scale**. For example, in the **key of C**, their relationship with the notes and the **solfège** is as follows:

Note: C D E F G A B Solfège: do ré mi fa sol la si Notation: 1 2 3 4 5 6 7

In G:

Note: G A B C D E F# Solfège: do ré mi fa sol la si Notation: 1 2 3 4 5 6 7

When the notes are read aloud or sung, they are called “do, re, mi, fa, sol, la, si”. (“Si” has been supplanted in Great Britain and the U.S. by “ti”, for the sake of having a different beginning consonant for each degree.)

1.2 Octaves

Dots above or below a musical note raise or lower it to other **octaves**. The number of dots equals the number of octaves. For example, “6” with a dot below is at an octave lower than “6”. Musical scales can thus be written as follows:

. Major scale: 1 2 3 4 5 6 7 1 Natural minor scale: 6 7 1 2 3 4 5 6 · ·

Where there is more than one dot above or below the number, the dots are vertically stacked.

Where there are note length lines (see following section) underneath the numbers, any dots are placed below the lines. Thus the dots below numbers do not always vertically align with each other, since some of them may be moved slightly downward so as not to collide with the note length lines.

1.3 Chords

Chords can be transcribed by vertically stacking the notes, with the lowest note at the bottom as with Western notation. Each note has its own octave dots, but only the lowest note has the length lines (next section).

Arpeggiated chords are notated by writing the standard Western arpeggiation symbol to the left of the chord.

Chord symbols such as Cm may be used if the exact voicing is unimportant.

1.4 Note length

The plain number represents a **quarter note** (crotchet). Each underline halves the note length: One represents an **eighth note** (quaver), two represent a **sixteenth note** (semiquaver), and so on. Dashes after a note lengthen it, each dash by the length of a quarter note.

A dot after the plain or underlined note works increases its length by half, and two dots by three quarters.

The underline, along with its joining, are analogous to the number of flags and beaming in standard notation. So are dotted notes. But the analogue stops at notes worth 3 quarter notes and beyond, where dashes are used instead.

Whole (semibreve): 1 - - - Dotted whole: 1 - - - - - Double dotted: 1 - - - - - - Half (minim): 1 - Dotted half: 1 - -
 Double dotted: 1 - - · Quarter (crotchet): 1 Dotted quarter: 1 · Double dotted: 1 · Eighth (quaver): 1 Dotted eighth:
 1 · Double dotted: 1 · 16th (semiquaver): 1 =

1.5 Musical rest

The number “0” represents the **musical rest**. The rules for length is similar to that of the note, except that it is customary to repeat “0” instead of adding dashes for rests longer than a quarter rest. Unlike the **standard notation**, there is no single symbol for the bar rest. The bar rest of 3/4 time is "l 0 0 0 l" and the bar rest of 4/4 time is "l 0 0 0 0 l". For brevity the multi-bar rest symbol used in standard notation may also be adopted.

1.6 Undetermined pitch

When notating rhythms without pitch, such as in many **percussion instruments**, the symbol “X” or “x” replace numerals. For example, a common clap pattern used in **cheers** can be written like this:

4/4 >> Clap: | X X X X X | X X X X 0 X X ||

1.7 Bar lines

Bar lines, double bar lines, end bar lines, repeat signs, first- and second-endings look very similar to their counterparts in the **standard notation**. The ending numbers, though, are usually slightly less than half as big as the numerals representing notes.

When several lines of music are notated together to be sung or played in harmony, the bar lines usually extend through all the parts, except they do not cut across the lyrics if these are printed between the upper and lower parts. However, when notating music for a two-handed instrument (such as the **guzheng**), it is common for the bar lines of each hand to be drawn separately, but a score bracket to be drawn on the left of the page to “bind” the two hands together. This bracket is not the same as the bracket used on a Western piano staff; it's more like the bracket used to bind an orchestral section together in Western music. Sometimes the final double barline, and any barlines marked with repeat signs, also pass through both hands, but this is not consistent even in the same publication (see for example *Xinbian Guzheng Jiaocheng* ISBN 7-5359-2188-4 pages 108 and 138, where they do and do not pass through both hands respectively).

If a piece of music for a two-handed instrument has a passage where only one hand is notated, lines of numbered notation without score brackets at the left can be used for this passage. Hence a piece of music may shift between two-handed (with bracket) and one-handed (without bracket) layouts during the course of the piece.

Cadenza-like passages can have dotted barlines, or barlines can be omitted altogether.

It is possible to print a small fermata above a bar line; this represents a brief pause between the measures either side of the barline, as in Western notation.

1.8 Accidentals and key signature

The notation uses a **movable Do(1)** system. The **key signature** defines the pitch of “1”. So “1=C” means “C major”. Minor keys are based on the **natural minor** or the **Aeolian mode**, and the key signature defines the pitch of “6” of the minor key's relative major. So “6=A” means “A minor”, the tonic of which is written as 6. Naturally, the **Dorian mode** of D should be marked as “2=D” and based on 2. Some people prefer to write “Key: C” or “Key: Cm” instead.

The same **accidentals** in the **standard notation** are used, and as in common practice, an accidental is placed before the notes “1 2 3 4 5 6 7” to raise or lower the pitch and placed after the note names “C D E F G A B”, which are used for key signature and **chord markings** in the numbered system. But these accidentals are relative to the **diatonic scale** (1 2 3...) rather than the note names (C D E...). For example, even though the **leading note** for the harmonic C minor scale is “B natural”, it is written as “#5”.

Key signature changes are marked above the line of music. They may be accompanied by symbols that represent the note's degrees at previous and present key signatures.

1.9 Time signature

The **time signature** is written as a fraction: 2/4, 3/4, 4/4, 6/8, etc. It is usually placed after the key signature. Change of time signature within the piece of music may be marked in-line or above the line of music. Some pieces that start with cadenza passages are not marked with time signatures until the end of that passage, even if the passage uses dotted barlines (in which case 4/4 time is usually implied).

Sometimes a piece is written with multiple time signatures simultaneously. For example, it might specify 4/4 2/4 3/4 5/4, meaning that the length of measures is irregular and can be 4, 2, 3 or 5 quarter-notes. The time signature of the first measure is always specified first, and the others are placed in increasing order of length.

Usually, the time signature is formatted as two numbers placed vertically on top of each other, with a horizontal line separating them. This is slightly different from the formatting illustrated in the text above, due to technical restrictions.

A metronome mark may be placed immediately after the time signature if the time signature is part-way through the music, or below it if the time signature is at the beginning. If present, this will be identical to the metronome marks used in Western music (this is the only place in numbered notation where Western symbols for note values such as quarter-notes and eighth-notes are used).

1.10 Ties, slurs and tuplets

Ties and slurs are curves resembling that in the standard notation, although they are always written above the music line in numbered notation. Ties are much flatter than slurs; usually only the ends of a tie are curved, whereas slurs are curved throughout. Chinese music books often draw ties and slurs with a single thin line, in contrast with the Western practice of making the line thicker in the middle.

In music for two hands, it is possible to write a slur that begins in one hand and ends in the other; this is usually done when the first hand has nothing more to play in that measure and hence there is room to draw the slur in the space which would normally have been used to draw further notes. This is similar to some Western keyboard music where slurs between the staves are possible.

A slur with a small arrowhead on its right-hand end indicates a pitch bend between the notes under the slur, which is possible on some instruments.

Tuplets (such as triplets, quintuplets, etc.) are notated by writing a slur-like symbol over the notes and printing a small digit (3 or 5 or whatever is appropriate) in the center of this symbol, so that the line passes through the digit.

1.11 Expression marks and dynamics

Expression marks (including fermatas) are also written above the music line. Special attention has to be paid on the *staccato* dot since it looks like the octave changer. It is either represented by a bolder dot further away from the music line or by the *staccatissimo* sign instead, which is an inverted triangle.

Dynamics (*p*, *f*, *mf*, etc.) and hairline crescendos and diminuendos are written below the line of music to which they apply, as in Western notation. The font of the dynamics is usually lighter than the font used in Western notation, so as not to be as heavy as the font for the numbers.

1.12 Fingering and other instrument-specific marks

Instrument-specific symbols can be written above notes. For example, in music for stringed instruments it is common to see wavy lines representing rolls. Fingering can be marked using four different kinds of finger symbol, respectively appearing like a lightning strike, the top half of a semicircle, a backslash, and the bottom left corner of a square.

Other instrument-specific symbols that are sometimes used include one resembling three slashes progressing diagonally downward, placed to the lower right of the numeral. This represents a tremolo. Another symbol is formed of a line proceeding from slightly to the right of the top right corner of the numeral and curving upwards, ending with the left half of an arrowhead. This denotes a slide to a higher note (the exact pitch not always being specified), equivalent to *portamento* in Western music.

If there are slurs or ties and also fingering symbols, then the fingering symbols are written above the slurs or ties. Rolls (wavy lines) and tuplets are usually written below the slurs or ties. However, if a one-off chord results in many

digits being stacked on top of each other and also has a roll symbol, it is possible to place that roll symbol above any slur or tie line to save space (to avoid moving the slur or tie any higher than the chord has already needed to move it).

1.13 Glissandi

Glissandi are represented by diagonal wavy lines with arrowheads at the end. The *glissando* symbol proceeds from bottom left to top right for an upward glissando, or from top left to bottom right for a downward glissando. It is used in place of a numeral. For stringed instruments, it usually indicates playing all the notes of the scale in rapid succession, i.e. for a downward glissando,

. 1 6 5 3 2 1

and for an upward glissando,

. 1 2 3 5 6 1

Note that a *pentatonic* scale is normally used in Traditional Chinese music, so “all the notes of the scale” in this case are 1, 2, 3, 5 and 6.

Extended glissandi (over several octaves) are also possible, usually written with a longer diagonal wavy line that is nearly touching the numbers on either side of it. In this case the numbers on either side determine the starting and ending pitches for the glissando.

1.14 Grace notes

Grace notes are notated like normal notes but are written in a small (about half-size) script on the line just above. They are written with octave dots and note-length lines, and they are connected to the main note with a slur that proceeds vertically downward from the center of the note-length line of the grace notes and points toward the main note. Grace notes may be placed either before or after the main note, indicating that they are to be played very rapidly either before the start of the main note or after the end.

2 Variations of the numbered musical notation

In some versions of the numbered musical notation, underlines indicating note length are written above the note instead. Ties and slurs may be written below the music line.

In some versions, octave change is represented in a different way. Instead of dots above or below the numbers, a horizontal line is drawn and the number is written on, above, or below the line.

Another variation is to put octave bar "|" on the side of the number. An octave bar on the left is equivalent to a dot at the bottom. An octave bar on the right is equivalent to a dot on top. This is used in *Digital Common Notation*. *Digital Common Notation* attempts to combine the benefits of the standard notation and numbered musical notation and is targeted for keyboard performing.

3 Performing numbered music on keyboard

It is possible to perform music in numbered musical notation in the traditional way. The player first locates the root note of the key on the keyboard and then mentally map the number to the keys on the keyboard. This should not be difficult for someone who can play the scales with traditional piano training.

A simple way is to transpose the root note to where the middle C is. The music can then be performed with the same fingering as in C Major. This approach actually reduces the 12 sets of fingering down to one. The method is described in *MRN Method (Middle Root Note Method)*.

4 History and usage

A similar invention was presented by Jean-Jacques Rousseau in his work presented to the French Academy of Sciences in 1742. Due to its straightforward correspondence to the standard notation, it is possible that many other claims of independent invention are also true. Grove's credits Emile J.M. Chevé.* [1]

Although the system is used to some extent in Germany, France, and the Netherlands, and more by the Mennonites in Russia, it has never become popular in the Western world. See the external links for more information.

The system is very popular among some Asian people, making conventions to encode and decode music more accessible than in the West, as more Chinese can sight read *jianpu* than standard notation. Most Chinese traditional music scores and popular song books are published in *jianpu*, and *jianpu* notation is often included in vocal music with staff notation.

Indexing with numbered notation makes it possible to search a piece of music by melody rather than by title. An actual example can be found in the Chinese New Hymnal. Parson's code on the other hand contains information on rise and fall in pitch only but precise pitches can be decoded from numbered notation. This way, a children's song book be indexed like this:

11·1·11 23·1 Row, row, row your boat | 1 1 5 5 | 6 6 5 - | Twinkle, twinkle little star | 1 2 3 1 | 1 2 3 1 | Frere Jacques

A reason for its popularity among Chinese is that *jianpu* fits in with the Chinese music tradition. It is a natural extension and unification of the *gongche* notation widely used in ancient China for recording music. *Gongche* uses a number of characters to indicate the musical notes, and *jianpu* can be seen as using numbers to replace those characters. The monophonic nature of music in Chinese tradition also contributes to widespread use because so few elements are needed for monophonic music that music can be notated with little more than a typewriter.

Compared with the standard notation, the numbered notation is very compact for just the melody line or monophonic parts. It is even possible to transcribe music in between the lines of text. Transcribing harmony can be done by vertically stacking the notes, but this advantage diminishes as the harmony becomes more complex (or polyphonicity increases). The standard notation, with its graphical notation, is better in representing the duration and timing among multiple notes.

5 Examples

The two images below illustrate how the same piece of music is written using the standard notation and the numbered notation.

AMAZING GRACE

John Newton, 1779

A - maz - ing grace! How sweet the sound, That saved a wretch like me! I
once was lost, but now I'm found, was blind, but now I see.

The hymn "Amazing Grace" written in standard notation.

AMAZING GRACE

1=C 3/4

5	1̇ - 3̇1̇	3̇ - 2̇	1̇ - 6	5 - 5	1̇ - 3̇1̇	3̇ - 2̇3̇	5 -
3	3 - 5	b7 - b7	4 - 4	3 - 3	3 - 5	1̇ - 5	5 -
A- maz- ing grace! How sweet the sound, That saved a wretch like me!							
5	1̇ - 1̇	1̇ - 1̇	6 - 6	1̇ - 1̇	5 - 5	1̇ - 1̇	7 -
1	1 - 5	1 - 5	4 - 4	1 - 5	1 - 3	5 - 1̇	5 -
2̇3̇	5 - 3̇1̇	3̇ - 3̇2̇	1̇ - 6	5 - 5	1̇ - 3̇1̇	3̇ - 2̇	1̇ -
5	3 - 5	b7 - b7	4 - 4	3 - 3	3 - 5	1̇ - 4	3 -
I once was lost, but now I'm found, was blind, but now I see.							
7	5 - 1̇	1̇ - 1̇	6 - 6	1̇ - 1̇	5 - 5	1̇ - 7	1̇ -
5	1 - 5	1 - 5	4 - 4	1 - 5	1 - 1	5 - 5	1 -

The hymn "Amazing Grace" written in numbered musical notation.

6 Software for printing numbered notation scores

A number of Chinese-language Microsoft Windows applications are available for the WYSIWYG editing of scores (optionally with lyrics) in numbered musical notation.*[2]*[3]*[4]*[5]*[6]*[7] Typically these support **only** the numbered notation, i.e. it is not possible to mix the numbered notation with a Western-style score in the same file, but it is also possible to add numbered notation to Sibelius scores via a Chinese-language third-party plugin.*[8] English-language applications for working with numbered-notation scores are relatively rare, but there have been some developments.*[9]*[10] There are technical methods of printing numbered notation (in various forms) with GNU LilyPond.*[11]*[12]*[13]

7 See also

- Musical notation
- Staff (music)
- Siffernotskrift, used in Scandinavia
- Frequencies for musical Notes

8 References

- [1] Grove Music Online (subscription required but many public libraries are subscribed; URLs vary). China, §II: History and theory. Alan R. Thrasher, et al.
- [2] JP-Word 简谱编辑, commercial software with limited demo version
- [3] MeiDeLi JianPu
- [4] 作曲大师简 (Music Master)
- [5] QuickMake Jianpu software (QuickMake 简谱软件)

- [6] 简谱乐章 (Jianpu Yuezhang), apparently no longer distributed by its author but a limited freeware version (免费版) is available at various Chinese file-sharing sites
- [7] TTComposer (TT 作曲家) published by 打本公司 1999-2001
- [8]
- [9] S-Music (free software; requires Microsoft Windows)
- [10] SimpErhu, a freely-available TrueType font with a set of Microsoft Word macros for adding numbered notation to documents
- [11] LilyPond documentation: Ez_numbers_engraver
- [12] lilypond-user discussion archives: jianpu-ly
- [13] lilypond-user discussion archives: numbered notation using \markup and TeX

9 External links

- A page in The Life and Work of Jean-Jacques Rousseau shows his published work.
- Ziffersystem (Numerical Musical Notation) in the Global Anabaptist Mennonite Encyclopedia Online.
- Can You Shake It? The Angklung of Southeast Asia has examples of cipher notation used in South Asian music.
- A variation of numbered notation for keyboard performing Digital Common Notation
- A method for performing numbered notation on keyboard MRN Method (Middle Root Note Method)
- Explanation by Matt Springer for musicians trained on western sheet music (website moved and URL updated by Matt Springer, 12/2011).
- Chinese-flute.com - transcribe from numbered to western musical notation - a transcription script written for Chinese flute (dizi) music.

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10.1 Text

- **Numbered musical notation** *Source:* https://en.wikipedia.org/wiki/Numbered_musical_notation?oldid=721885089 *Contributors:* Kaihsu, Gidonb, Chowbok, DMG413, Felix Wan, Deryck Chan, HenryLi, RyanGerbil10, Fdewaele, Wahoofive, Gaius Cornelius, SMcCandlish, CharlieHuang, Timotheus Canens, Bluebot, Neo-Jay, Sam steiner, Da Vynci, Frokor, Iridescent, Blehfu, Thijs!bot, Visik, MsDivagin, Magioladitis, Brusegadi, Silas S. Brown, Lumi23, The Thing That Should Not Be, Nnemo, Yoshi Canopus, Floofa, Black Knight takes White Queen, Life of Riley, XLinkBot, Ec0000, MatthewVanitas, Addbot, SimpErhu, BepBot, Lightbot, Jpedant, Luckas-bot, Yobot, Pt-botgourou, THEN WHO WAS PHONE?, Necronaut, AnomieBOT, Rjanag, Bojnin, Thehelpfulbot, FrescoBot, Double sharp, Eman235, Jurgott, Laopi Tongzhi, Lifanxi, Superjesi and Anonymous: 48

10.2 Images

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