

# Thumb piano

The **thumb piano** is an African musical instrument, a type of plucked idiophone common throughout Sub-Saharan Africa.

## Description

Each note of a kalimba, mbira, etc. is a separate idiophone, and in orchestral terms, the instrument as a whole belongs in the bar percussion family (specifically: lamellophones). Furthermore, the thumbs are not exclusively used, as some instruments are played with the thumbs and other fingers also.

Thumb pianos traditionally consist of a wooden board to which metal tines of varying lengths are affixed. Some have mechanisms for readily tuning the tines to different scales. The longest tines are typically in the center, with shorter (and thus higher-pitched) tines arranged alternately in ascending order towards both sides of the instrument. The thumb piano is most commonly held in both hands, with both thumbs being used to pluck tines either simultaneously or in turn

Modern variations of the instrument may have more than the traditional array of 15 tines, with as many as four fully chromatic octaves, making the playing of more complex music possible. The thumb pianos are made of different woods, either with only a sound board or often with a resonant chamber. Those with hollow resonating chambers for increased volume, often have two holes on the back that can be used to create a vibrato as the fingers cover and open these holes.

## Acoustics

Lamellophones are instruments which have little tines, or "lamellae", which are played by plucking. Unlike stringed instruments or air-column instruments like flutes, the overtones of a plucked lamella are inharmonic (i.e., the overtones and the fundamental vibration do not harmonize), giving the kalimba a rather odd sound. However, the inharmonic overtones are strongest in the attack and die out rather quickly, leaving an almost pure tone which is quite beautiful.

The tuning of most kalimbas, with the notes in the scale ascending on the tines from the center outward in an alternating right-left fashion, results in chords being made by adjacent tines. When any tine is plucked, the adjacent tines also vibrate, and these harmonizing secondary vibrations serve a similar role to the harmonic overtones of a string instrument - they increase the harmonic complexity of an individual note, though in a strange yet pleasing way.

Tines on the Array Mbira are arranged so that the most consonant intervals (octaves, fifths, and fourths) vibrate along with the fundamental. Furthermore, each tine is bent at a certain angle to produce overtones (most notably the 6th harmonic, or two octaves plus a fifth) that are more consonant.



A Zimbabwean *mbira dza vadzimu*.

## History

Various kinds of thumb pianos have existed in Africa for thousands of years. The keys were originally made of bamboo but over the years metal keys have been developed. The instrument is known by different names in different regions of Africa, including **Mbira**, **Mbila**, **Mbira Huru**, **Mbira Njari**, **Mbira Nyunga**, **Marimba**, **Karimba**, **Kalimba**, **Likembe**, **Okeme**, as well as **marimbula** (also called **kalimba**) in the Caribbean Islands.

The kalimba appears to have been invented twice in Africa: a wood or bamboo-tined instrument appeared on the west coast of Africa about 3000 years ago, and metal-tined lamellophones appeared in the Zambezi River valley around 1,300 years ago (Kubik, 1998). These metal-tined instruments traveled all across the continent and differentiated in their physical form and social uses as they spread. Kalimba-like instruments came to exist from the northern reaches of North Africa to the southern extent of the Kalahari desert, and from the east coast to the west coast, though many or most groups of people in Africa did not possess kalimbas. There were thousands of different tunings, different note layouts, and different instrument designs, but there is a compelling case from Andrew Tracey about a hypothetical tuning and note layout of the original metal-tined instrument from 1,300 years ago.

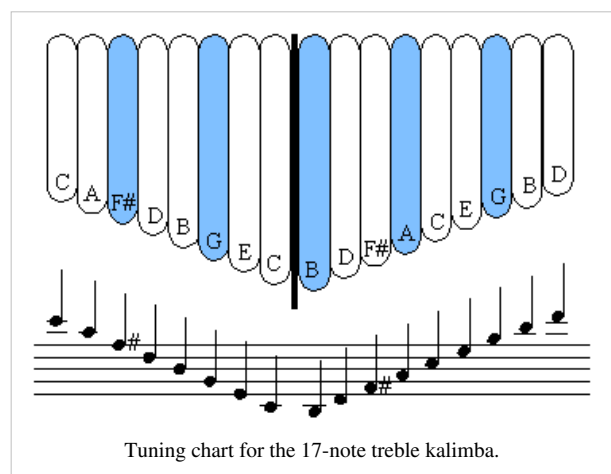
The thumb piano was typically played while walking by traveling Griots, African poet bards who keep the history of the tribe or village, and to entertain people with songs, stories, poems, dances, etc. It was thought in ancient times that the thumb piano was able to project its sound into the heavens and could draw down spirits to the earth. Some of them were evil spirits so the people would stop playing the music until the spirits had departed from the area.

Many players and griot clans have their own idiosyncratic tunings. Most of the time the instrument is played solo and tuning is not as critical as when playing with other musicians. But the tuning can be changed by adjusting the length of the metal tines inward or outward. It is also often an important instrument to be played at religious ceremonies, weddings, and other social gatherings. It is a particularly common musical instrument of the Democratic Republic of Congo and the Shona people of Zimbabwe.

In the mid 1900's the instrument was the basis for the development of the Kalimba, a westernized thumb piano designed and marketed by the ethnomusicologist Hugh Tracey. This has become very important in popularizing the instrument outside of Africa. While the arrangement of notes on a thumb piano is considerably different from those on a piano or guitar, their arrangement is fairly intuitive, and it is considered to be an instrument easily learned. This quality is exploited in many elementary schools who use the thumb piano as an entry-level instrument. One of its indigenous names for this instrument can be translated as "The thing that makes walking easier" and as such it could be considered "the first walkman."

## Tunings

Most western instruments have a simple linear visual mapping from the instrument to the pitch which is played: on a piano, the further left you go, the lower you go, and higher notes are to the right. String instruments have a similar mapping – the further up the neck you go, the lower the pitch – but this progression is realized independently on each string. Most western string instruments have a similar progression from one string to the next: each violin string, for example, is a perfect 5th higher than the previous one. Such consistent spatial mappings from the instrument to the pitches it plays promotes the development of intuition and aids in the learning of the instrument and even the ability to improvise or play by ear.



It is common on African mbira and other lamellophones to have the lowest notes in the center with higher notes to the far left and the far right - this is an ergonomic nicety, in that the thumb can pivot such that all the tines are easy to reach. However, traditional African tunings use notes that do not lie on the grid of the western tempered scale, and traditional kalimba note layouts are often idiosyncratic, sometimes with adjacent tines making part of a scale, but then an odd note thrown in that defies the pattern.

The Hugh Tracey kalimbas are tuned diatonically in the key of G. The arrangement of the notes on the Hugh Tracey kalimba borrows from the typical scheme with the lowest notes in the center and the upper notes on the left and the right, but a regular note layout is used, with the notes in the ascending scale alternating strictly right-left and going outwards towards the two sides. With this bidirectional note layout, it seems that all intuition from linearly mapped instruments goes out the window. This arrangement requires that the kalimba player develop a new intuition, but that new intuition is not as hard to come by as the more idiosyncratic note layouts of the traditional African lamellophones.

The diatonic western kalimba tuning Hugh Tracey used was practical for a worldwide instrument - with hundreds of African kalimba tunings, the chosen western standard would maximize the number of people who would immediately connect with the kalimba. The beauty of this note arrangement, with notes going up the scale in a right-left-right-left progression, is that modal 1-3-5 or 1-3-5-7 chords are made by playing adjacent tines and are trivial to learn and play. If chords are played in the lower octave, the same notes will appear on the opposite side of the kalimba in the upper octave, which makes it very easy to simultaneously play a melody in the upper octave and an accompanying harmony in the lower octave. So, the arrangement of notes on the Hugh Tracey kalimba (and on virtually any kalimba you find, as this note layout scheme has been adopted by virtually everyone who copies the Hugh Tracey kalimba) makes some complex musical operations very simple and easy.

Alternative tunings are possible, as the tines of most kalimbas are easily pushed in and out to sharpen or flatten their pitch. Some alternative tunings simply change the key of the kalimba, without changing the note layout scheme. Other alternative tunings move the kalimba to non-modal scales (such as Middle-Eastern scales). Each note of the kalimba can be tuned independently (unlike a guitar), so any scale, western or non-western, is possible, and traditional African scales are still accessible to this modern African instrument. Composer Georg Hajdu has tuned the Hugh Tracey alto kalimba to the chromatic steps of the Bohlen–Pierce scale in a piece called *Just Her - Jester - Gesture*. The Bohlen–Pierce scale subdivides the just twelfth into 13 steps.

The Chromatic Kalimba is also a fairly new instrument. There are a few different makers of the chromatic kalimba. One is the Hugh Tracey/AMI 2 octave kalimba which ranges from the G below middle C up to the G above the top line of the treble clef. The accidentals are mounted on the rear side of the kalimba as flats right under their adjacent parent note from the top. Recently, (2010) Aaron Chavez modeled an idea for the 4 octave chromatic kalimba utilizing octaves C2-C6. JBH Guitars is the original maker of this 4 octave chromatic.

## Other variants

A special type of thumb piano is the Array mbira, consisting of as many as 150 tines configured in a special order based on the circle of fifths (see Isomorphic keyboard.) The Guitaret is an electric lamellophone made by Hohner and invented by Ernst Zacharias, in 1963.<sup>[1]</sup>

In the late 20th century instrument builder and musician Robert Grawi was inspired by playing cross rhythms on a thumb piano to create a new westernized African instrument called the gravikord. It is an electric double harp made of modern materials mostly stainless steel tubing. The tuning is based on the "G" tuning of the kalimba but its overall structure is based on the West African kora. It has 24 notes evenly divided between two ranks of strings in notches on a free standing double bridge. Tones rise in a strictly alternate right/left hand symmetry familiar to any kalimba or thumb piano player, so that any tunes and techniques that are learned on these instruments can also be played on the gravikord.<sup>[2]</sup>

## Kalimba



A Hugh Tracey treble kalimba

### Popularity

Hugh Tracey, an English ethnomusicologist who moved to Africa in 1920, spent several years from the 1920s through the 1950s traveling about in rural Africa (i.e., as far away as he could get from western musical influences such as radio, eastern-influenced bands, and Christian missionaries) where he recorded traditional music and documented the tunings and note layouts of the different kalimbas. However, when Hugh Tracey founded the company African Musical Instruments and started building kalimbas in Rudespoort, South Africa, and exporting them around the world in 1954, the note layout and tuning were not traditional. Rather, the kalimbas were tuned diatonically in the key of G, with adjacent notes on the scale sitting on opposite sides of the kalimba.

The first kalimba to be exported commercially out of Africa was the Hugh Tracey Kalimba. After years of studying African music and dozens of prototype instruments, Hugh Tracey's company African Musical Instruments also began manufacturing kalimbas, a western version of the mbira, in the late 1950s. The name kalimba is a Bantu word which means "little music", and is similar to the word karimba, a type of mbira.

While kalimba initially meant the Hugh Tracey kalimba, the name kalimba is now a generic name and can describe any non-traditional thumb piano, or can even be used generically for the traditional lamellophones of Africa (i.e., the mbira, karimba, sansa, etc.).

In the early 1960s, Hugh Tracey secured an initial order of 10,000 kalimbas with Creative Playthings of Princeton NJ, a company which designed and distributed innovative toys and furniture, mostly made from natural materials. And so, many people bought their first kalimba from a toy store. People quickly realized that the kalimba was not a toy, but a real instrument capable of real music.

Soon, African Musical Instruments began making other styles of kalimba with similar, but different note layouts. The original kalimba was named the Treble, and a larger, lower pitched 15-note model called the Alto was introduced. See the ALTO tuning chart below:

Similarly, different kalimba models with the same note layout were also introduced over time. Most traditional African kalimbas had the tines mounted on a flat board, rather than on a box, though some traditional kalimbas were mounted on a piece of wood which was hollowed out to provide a resonant box. The flat board kalimbas could be placed inside or on top of a hollow gourd, which was used as a resonator to amplify and alter the quality of the sound the kalimba produced. The new board-mounted Hugh Tracey kalimbas were a nod to the traditional African kalimba designs. The smaller board-mounted Hugh Tracey kalimbas were given the name "celleste" (as in "celleste treble").

Shortly after the Hugh Tracey kalimba started being sold around the world, artisans and craftspeople started copying the design, or adapting the design. Several high quality kalimba makers exist around the world today: Lucinda Ellison, Andrew Masters, David Bellinger, Steve Catania, Luc DeCock, R. P. Collier, and Greg Trimble. On the other hand, most kalimbas sold today are inexpensive copies made in third world countries such as Pakistan or Indonesia.

African Musical Instruments continues to produce high quality kalimbas from their shop in South Africa. They have expanded their offerings to over a dozen different kalimba models, ranging from an 8-note student model to a modern version of a traditionally tuned Shona karimba. AMI also makes high quality marimbas and drums.

A few artists, including Genesis, Earth, Wind & Fire, Jo Mango, King Crimson, John Mayer, Laura Barrett, and Vampire Weekend have also incorporated the kalimba into Western pop and rock music styles.

Maurice White, the Founder and Leader of the popular group Earth, Wind & Fire, gave immense exposure to the Kalimba in the band's music. Earth, Wind & Fire recordings such as "Kalimba Story", "Evil", "Biyo" and "Departure", all revolved around White's electrified Kalimba solos. The Kalimba also proved to be an iconic symbol of the band's reflection of African-ism.

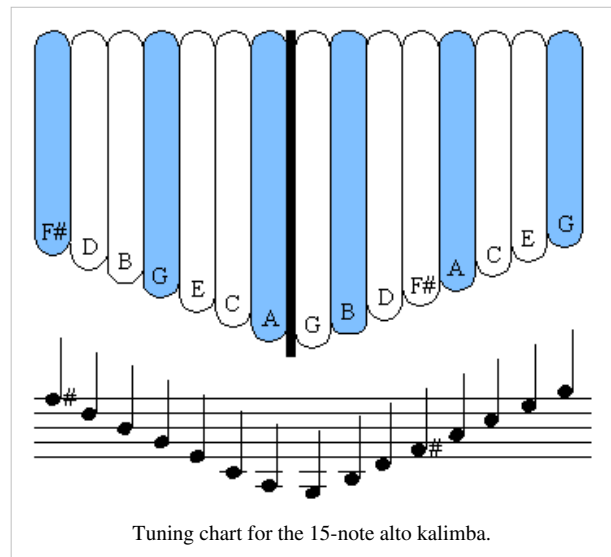
## Use in New Music

Finally, the kalimba also found its way into the domain of New Music where it is often used together with live-electronics. In his composition *kalimBAO* (2006), Sascha Lino Lemke uses a Kalimba with microtonal tunings, whereas in Karlheinz Essl's *Sequitur XIV* the kalimba is processed with a custom-made computer program. Both pieces were premiered by pianist Jennifer Hymer who also specializes in Kalimba performance.

The kalimba /mbira features extensively in the work of English composer and performer Tom Green both as Another Fine Day and with The Orb. The British national newspaper, *The Independent*, placed Green's kalimba driven album 'Life Before Land' at number three in it's list of all time greatest ambient albums.

A Kalimba (or Mbira) playing the opening theme from Pink Floyd's "A Saucerful of Secrets" along with milk-bottle flute introduces the first tune "I Believe in Milko" from The Ninth Tentacle's first album for the Cellartapes record-label: Voyeuradeism.

The 2007 tribute record "Four Songs by Arthur Russell" features Swedish singer-songwriter Jens Lekman using a kalimba in his rendition of Russell's "A Little Lost". While he had initially played ukulele for the cover (as broadcast live on the radio series "No Love For Ned" 21 February 2005), Lekman thereafter frequently featured the kalimba version in his live sets for a period.



In the late 20th century instrument builder and musician Robert Grawi was inspired by playing cross rhythms on the kalimba to create another new westernized African instrument called the gravikord. It is an electric double harp made of modern materials mostly stainless steel. The tuning is based on the "G" tuning of the kalimba but its structure is based on the West African kora. It has 24 notes evenly divided between two ranks of strings which rise in a strictly alternate right/left hand symmetry familiar to any kalimba player, so that any tunes and techniques that are learned on the kalimba can also be played on this instrument.

The kalimba was used by James Horner in the soundtrack to ALIENS, specifically in the cue "The Complex" (6-M-1).

## References

- [1] Hohner: Guitaret Manual, Trossingen Germany 1963
- [2] The Gravikord web site : <http://www.gravikord.com/instrument.html#gravikord>

## Further reading

- Warner Dietz, Betty and Olatunji, Michael Babatunde. (1965). Musical Instruments of Africa: Their Nature, Use, and Place in The Life of a Deeply Musical People. New York: John Day Company.

## External links

- <http://www.kalimbamagic.com/>
  - <http://www.asza.com/ikalim.shtml>
  - <http://ilam.ru.ac.za/>
  - <http://www.kalimba.co.za/>
  - <http://www.nscottrobinson.com/mbira.php>
  - <http://www.youtube.com/kalimbamagic>
  - <http://www.music.vt.edu/musicdictionary/textk/Kalimba.html> The tuning diagrams are incorrect.
  - <http://www.acoustics.org/press/155th/chapman.htm> David M.F. Chapman "The Sound of the African Thumb Piano (kalimba), Acoustics '08, Paris.
  - World Musical Instrument Database (<http://www.arcmusic.org/begin.html>). New York: Archive of Contemporary Music
-

# Article Sources and Contributors

**Thumb piano** *Source:* <http://en.wikipedia.org/w/index.php?oldid=457687560> *Contributors:* Alansohn, Asarelah, Attilios, Badagnani, Betacommand, Bricology, Bubbha, CambridgeBayWeather, Djinn112, Ear special, Ezeu, Fjeinca, Fritzpoll, Graham87, Hyacinth, Joaquin008, Marimbanation, Markholdaway, Mbirame, MoiraMoira, Numuse37, Prashanthns, Racism is gay, Redheylin, SHMEXILOPTART, Schizobullet, Unimath, Vinivillam, Zomno, 46 anonymous edits

# Image Sources, Licenses and Contributors

**Image:Mbira1.png** *Source:* <http://en.wikipedia.org/w/index.php?title=File:Mbira1.png> *License:* Creative Commons Attribution-Sharealike 2.5 *Contributors:* Alex Weeks, Later version(s) were uploaded by Jellocube27

**Image:Kalimba Treble Tuning.png** *Source:* [http://en.wikipedia.org/w/index.php?title=File:Kalimba\\_Treble\\_Tuning.png](http://en.wikipedia.org/w/index.php?title=File:Kalimba_Treble_Tuning.png) *License:* Creative Commons Attribution-ShareAlike 3.0 Unported *Contributors:* Kalimba\_Treble\_Tuning.jpg: Original uploader was Markholdaway at en.wikipedia derivative work: Mikhail Ryazanov (talk)

**Image:TrebleKalimba.jpg** *Source:* <http://en.wikipedia.org/w/index.php?title=File:TrebleKalimba.jpg> *License:* Creative Commons Attribution-ShareAlike 3.0 Unported *Contributors:* Original uploader was Markholdaway at en.wikipedia

**Image:Kalimba Alto Tuning.png** *Source:* [http://en.wikipedia.org/w/index.php?title=File:Kalimba\\_Alto\\_Tuning.png](http://en.wikipedia.org/w/index.php?title=File:Kalimba_Alto_Tuning.png) *License:* Creative Commons Attribution-ShareAlike 3.0 Unported *Contributors:* Kalimba\_Alto\_Tuning.jpg: Original uploader was Markholdaway at en.wikipedia derivative work: Mikhail Ryazanov (talk)

# License

---

Creative Commons Attribution-Share Alike 3.0 Unported  
[//creativecommons.org/licenses/by-sa/3.0/](http://creativecommons.org/licenses/by-sa/3.0/)