

Khaen: the bamboo free-reed mouth organ of Laos and Northeast Thailand

Notes for Composers

by Christopher Adler



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1. Construction and playing position



The khaen is held between the hands and air is blown into and sucked through the central windchest which holds all the pipes. Each pipe contains a small metal reed. When air moves in either direction through the pipe, it escapes through the finger hole and the pipe does not sound. When a finger hole is covered, the pipe sounds. It is therefore possible to play as many as ten notes simultaneously, or more if putty is used to activate drone pipes.

The khaen should therefore be considered a polyphonic instrument like the accordion or pipe organ.

2. Pitches and layout

The khaen plays a two-octave diatonic minor scale at a variable pitch level. The tuning is near-equal temperament and varies slightly from instrument to instrument. Since the pitch level is not standardized, it is convenient to notate khaen music in A minor and allow the instrument to transpose.



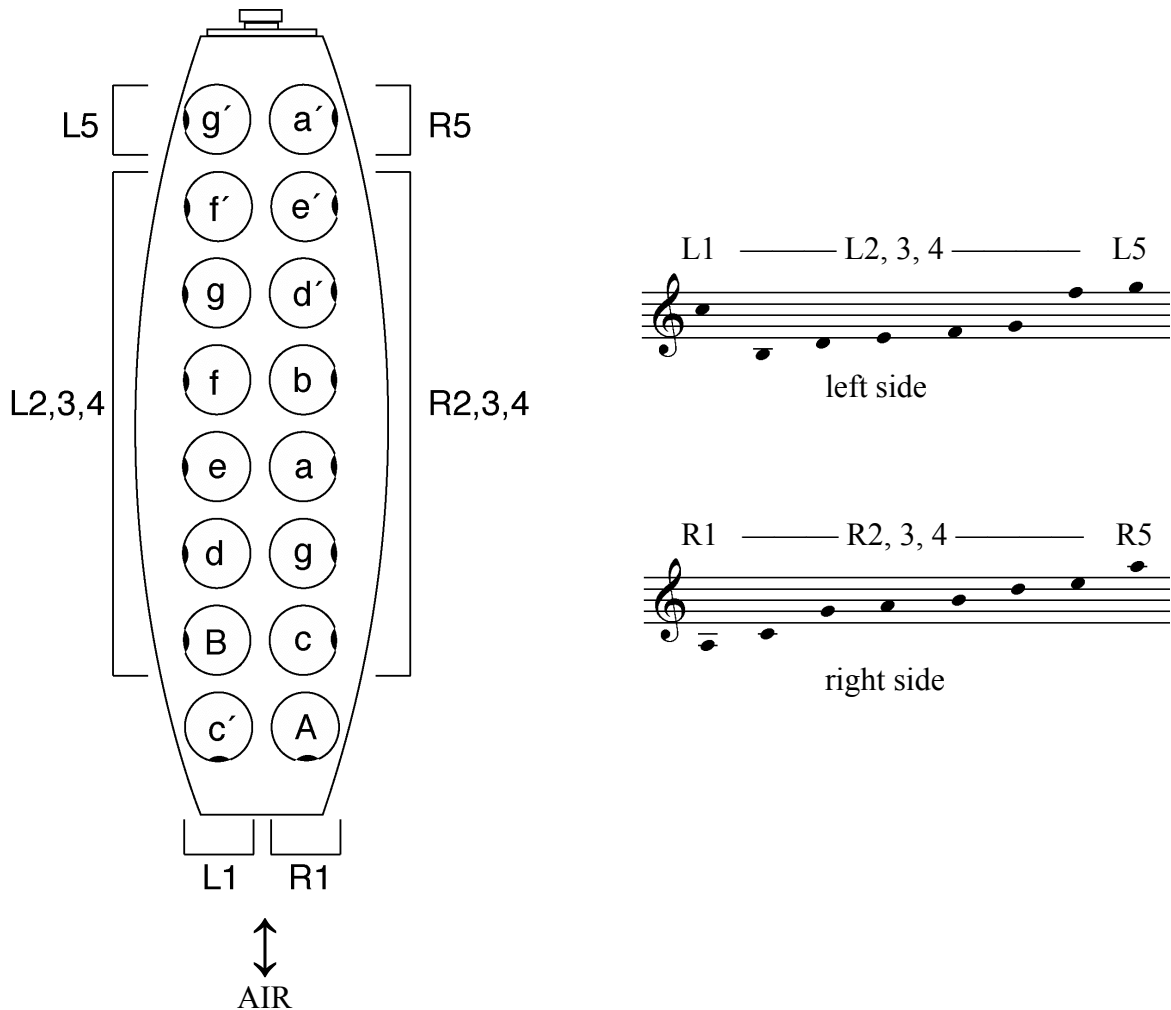
At present, I have khaen at the following pitches (referring to the sounding pitch of the lowest note): D, F, G, A, B-flat and B. The timbre and flexibility of each instrument varies, and for solo pieces I will select an instrument that suits the piece and context. Khaen are handmade instruments and do not last forever, so it is possible that pieces written for a specific pitch may become unplayable until instruments can be replaced. For khaen in combination with other instruments, I recommend using the khaen in G as I try to keep many of these instruments available.

The layout of the pitches as viewed from above is shown in the diagram on the following page. The position of the finger holes constrains both the thumb (1) and the pinky (5) finger of each hand to play only the indicated pitches. The other three fingers freely and easily reach the middle six pipes in any combination.

Note that the pitch **g** is duplicated on both side of the instrument. When a specific pipe is required, a small “L” or “R” written above the pitch may be used to indicate

In slow music, and with sufficient time to adjust hand position, it is possible to use the fifth finger to play other pitches, but bear in mind that this results in an awkward hand position which reduces flexibility of the other fingers (see *Five Cycles*). Reaching around the instrument such that both hands play on the same side is not feasible.

Each hole is small and sensitive and therefore it possible to play very rapidly, especially on higher-pitched instruments. The lower pipes of larger instruments speak more slowly especially at lower wind pressure.

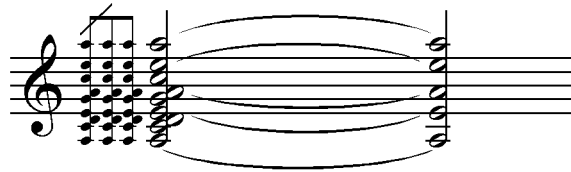


3. Breathing

Each pipe of the khaen sounds whether the air is moving in or out. It is therefore possible, and idiomatic to the instrument, to play continuously. Continuous legato playing is not possible, however, because a slight accent is created each time the breath changes direction. In traditional music, this is masked by nearly constant use of rhythmic accents made by tonguing. For legato playing, phrasing may be indicated as with any wind instrument with the understanding that no break or catch breath is required. It is possible to expel or take in air through the nose while playing so the breath changes can be placed somewhat flexibly regardless of dynamics. I am not able to do circular breathing. In general, the khaen does not require a high volume of air and so it is possible to play continuously for a very long time.

All manner of breath effects and tonguings are possible in order to create articulations. Standard wind instrument notation is appropriate for these.

Note that fluttertongue is only possible on an out-breath. Fluttertongue may be done with a variety of intensities, from a slight pulsating coloration to an extremely rapid staccato. The use of fluttertongue grace notes as an embellishing accent is idiomatic:



Breath tremolo, subtle or extreme, fast or slow, is possible, and may serve as an expressive coloration akin to vibrato.

4. Basic traditional idioms and techniques

Traditional Lao and Northeast Thai music consists of two layers: drone and melody. The melody is often embellished in parallel octaves, fifths and harmonies and may also be elaborately ornamented. For more detailed information about the structure of traditional khaen music, the best reference is Terry Miller, *Khaen Playing and Mawlum Singing in Northeast Thailand* (Greenwood Press, 1985). An additional useful reference is *The Garland Encyclopedia of World Music, vol. 4.: Southeast Asia* (see “Laos”).

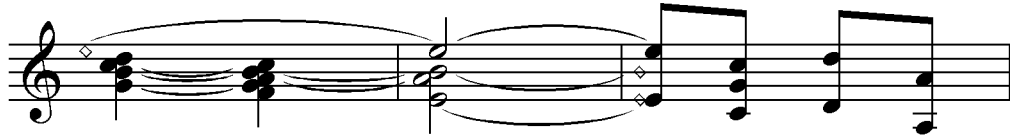
drones

If drones are used, they may be held by one of the fingers or stopped with putty. If a drone is stopped with a finger, note that it will constrain the hand position. For example, if the third finger holds the **a** on the right side of the instrument, the second and fourth fingers will each be limited to playing notes below or above the **a**, respectively. It is often possible, however, to quickly and subtly substitute the finger which holds a drone pitch. If putty is used to hold a drone pitch, care should be taken as to when the putty is placed or removed during the piece, if at all. Placing putty on a drone pitch during a pause or rest takes only a few seconds. For putty to be placed or removed while the instrument is sounding, the hand on the proper side of the instrument must be entirely free. This technique is awkward in performance but is possible (see *Epilogue for a Dark Day*).

I use a diamond-shaped notehead to indicate a drone pitch. An ordinary note tied to a diamond-shaped note indicates that the pitch is to be held as a drone from that point on. To indicate that the drone is to be released, a diamond-shaped notehead is tied to an ordinary note, thus indicating exactly the point at which the drone is to be released. This helps to reduce the visual density of the score, especially when multiple drones are used. In contemporary music, a note held for more than a measure or two may be more effectively notated as a drone.



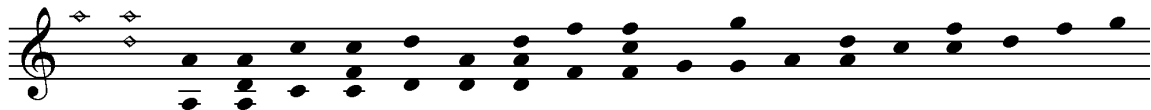
An example from *Epilogue for a Dark Day* demonstrating a change of drones held by the fingers (excerpt ©2001 Christopher Adler, all rights reserved):



modes

Traditional khaen playing is based on five melodic modes, each with characteristic drones and idiomatic melodic figures. These five modes are shown here in their most basic form, with alternative doublings for some notes, and with the different drones (diamond-shaped notes) that are typically used. The hand configurations within these modes are very idiomatic, comfortable and familiar. On one hand, music in these modes will be particularly easy to play, and on the other hand music in these modes will be more evocative of traditional music and therefore subject to expectations, associations and comparisons.

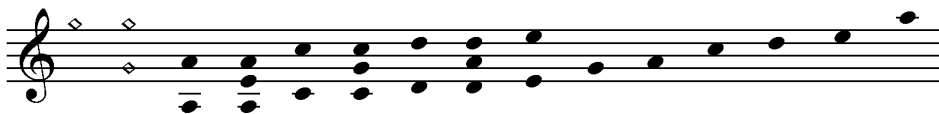
lai noi



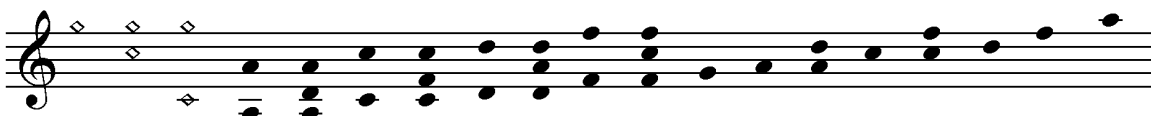
lai yai



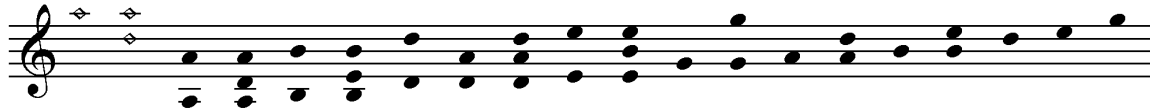
lai sootsanaen



lai bo sai



lai soi

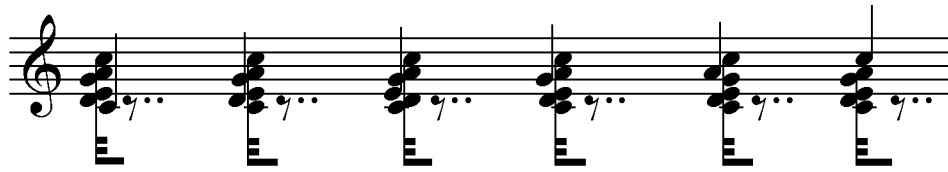


grace notes

Grace notes are frequently used as melodic articulations. These may be done singly or in octaves, fifths, or other combinations, may cover any interval provided the fingers are available, and may be performed very quickly.

chord-on-attack

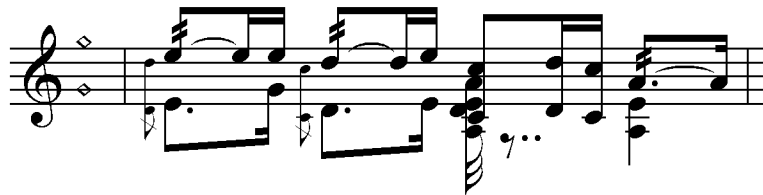
Another method of melodic articulation used in traditional playing is to play and rapidly release a cluster or harmony while holding only a melody note or notes. This results in a burst of sound similar to very strong tonguing but with an audible harmonic content. I prefer to notate it as shown below:



This technique is used extensively by Christopher Burns in *Triangulation* (see example in section 7, below).

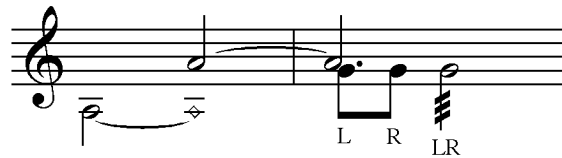
finger tremolo

This traditional technique is often used when playing a melody in parallel octaves. The lower melody note is held while the upper note is rapidly repeated with finger motion while the breath is steady. The result is akin to a breath tremolo or fluttersong, but on only one note. This may be done on any pitch (although rapid repetitions are more effective on the higher pipes which speak more quickly) or combination of pitches. The following is an artificial passage demonstrating the combination of many of these techniques as they are used in traditional playing:



A double tremolo on the pitch **g** is possible by using the pipes on both sides of the instrument. This may be notated by writing a single **g** with the tremolo symbol and writing "LR" above the pitch to distinguish it from a tremolo on a single **g**.

An example from *the wind blows inside* demonstrating a double tremolo (excerpt ©1997 Christopher Adler, all rights reserved):



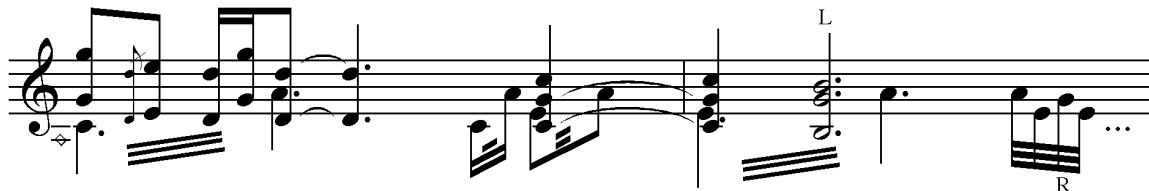
5. Dynamics

Note that the dynamic range of the khaen is small compared to most western concert instruments. The actual volume possible varies from instrument to instrument, but composers should simply be aware that a large variation in dynamics due to force of breath is not possible. Too little pressure will result in pipes not sounding or ‘whining’ out of tune. One way to achieve dynamic range effectively is to consider the number of pipes sounding, as with the harpsichord and pipe organ. Octave- and other doublings effectively increase the volume of sound, and large chords will seem particularly loud.

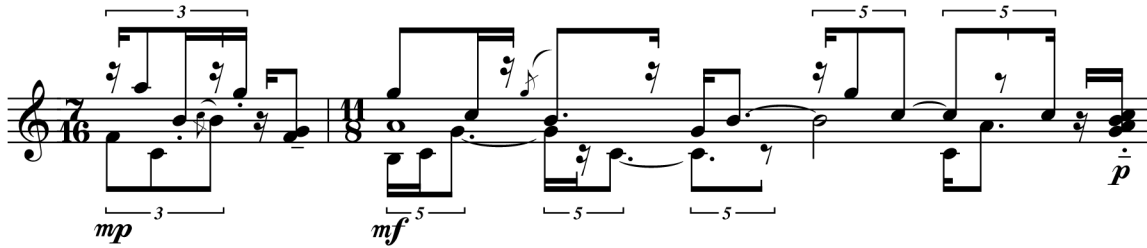
6. Modern notation

Khaen music may be notated on a single staff as in the above examples. The use of the drone symbol eliminates the visual clutter and unnecessary notation of pitches held as drones, so that the notation clearly shows moving voices. Fairly complex polyphony may be read from a single staff.

An example from *the wind blows inside* demonstrates three-voice polyphony (drone, sustaining tremolo and melody) notated on a single staff. Reading this particular example is aided by the fact that the melodic voice uses characteristic doublings of the *lai yai* mode (excerpt ©1997 Christopher Adler, all rights reserved):

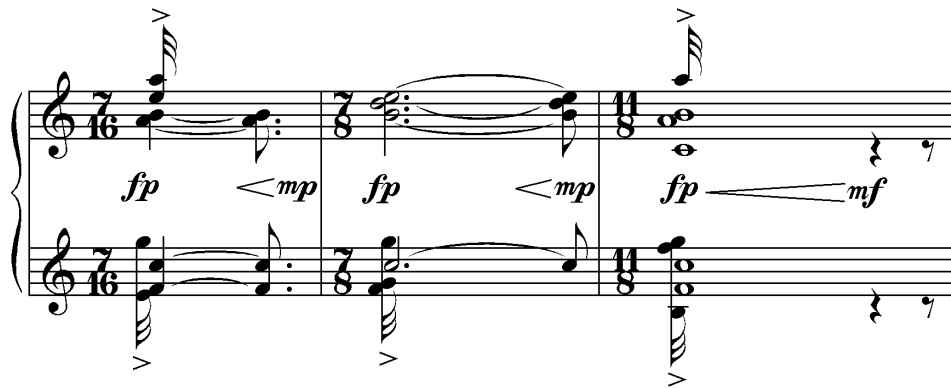


An example of polyphony from *Triangulation*, by Christopher Burns (excerpt ©2009 Christopher Burns, all rights reserved, used by permission):



In cases of dense harmonies, clusters, or sections in which the hands play independently, it is advantageous to notate using two staves, the upper staff for notes played by the right hand and the lower staff for notes played by the left. It is acceptable to switch between one and two staves in a single piece to facilitate ease of reading and conserve space.

An example of cluster harmonies much more easily read when notated on two staves, from *Triangulation*, by Christopher Burns (excerpt ©2009 Christopher Burns, all rights reserved, used by permission):



It is also possible to notate polyphonic layers of very different character on multiple staves, each of which potentially represents the full range of the instrument (see *Telemetry Lock*).

7. Extended techniques

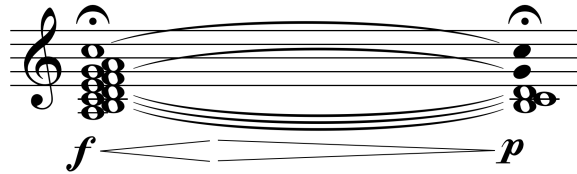
Half-hole technique, portamento, glissando, detuning, vibrato and harmonics are not possible on the khaen.

non-standard hand placement

It is possible to take the thumb or pinky out of regular position to play one of the pipes normally played by the 2nd-4th fingers. This takes extra time to ensure the holes are completely covered and so is best done for longer chords rather than melodic passages. It

is also best to do only one such out-of-position note at time as taking those fingers out of positions weakens the player's grip on the instrument.

In this excerpt from *Five Cycles* (excerpt ©2002 Christopher Adler, all rights reserved), the fifth finger of the left hand plays **f**, while the 2nd-4th fingers play **B-d-e**. This chord is preceded by a silence to allow careful placement of the fingers.



Similarly, in this excerpt from *Watawat*, by Sidney Marquez Boquiren (excerpt ©2017 Sidney Marquez Boquiren, all rights reserved, used by permission), the low B is played by the thumb of the left hand.



vocalization/singing

Vocalizing and singing into the instrument is possible. Of course, this may be done only on an out-breath. It is possible to independently control the relative dynamics of the singing and khaen, to an extent. Singing into the instrument modulates all the pitches in unpredictable ways, resulting in unsteady and vibrating pitches. When the sung pitch corresponds to a pitch of the khaen, that pipe may ring whether or not the finger hole is covered. When the finger hole is covered, that note may buzz more loudly than others. In *Tashi Delek*, singing a low G at a softer dynamic emulates the sound of the khaen without drastically modulating the timbre of other notes, effectively adding a note the khaen does not have. Sung glissandi over sustaining chords are used in *Three Body Problem*.

In this striking example from *Palpable Breathing*, by Vera Ivanova (excerpt ©2017 Vera Ivanova, all rights reserved, used by permission), the sung part is notated on the lower staff and the tremolo notation is used to indicate fluttertongue. The effect of the voice both emphasizes the melody in the first measure and modulates and destabilizes the sustaining voices throughout.

The image shows a musical score excerpt for measures 134-137. The upper staff is in treble clef and contains a vocal line with tremolo notation (vertical lines) and a melodic line. The lower staff is in treble clef and contains a sustaining voice line with a long note in the first measure and a tremolo notation in the second measure.

8. Contemporary works

Solo works

Christopher Adler, *Epilogue for a Dark Day* (2001)

Christopher Adler, *Five Cycles* (2002)

Christopher Adler, *Tashi Delek* (1998)

Christopher Adler, *Telemetry Lock* (1999)

Christopher Adler, *the wind blows inside* (1997)

* scores for these five pieces are available as a bound volume with commentary from www.christopheradler.com

Sidney Marquez Boquiren, *angel music* (2007)

Sidney Marquez Boquiren, *Watawat* (2017)

Christopher Burns, *Triangulation* (2008)

H. James Harkins, *Late Passing*, for khaen and electronics (2017)

Jeff Herriott, *Patterns in Wide Space*, for khaen and electronics (2011)

Vera Ivanova, *Palpable Breathing* (2017)

Yu Kuwabara, *Mystische Miniature* (2017)

David Loeb, *Karin: A Forest of Verses* (2006)

David Loeb, *Kawagiri: Rivermist in Summer* (2003)

David Loeb, *Emerging from the Deep Mist* (2011)

Matthew Welch, *Ulrikke* (2006/arr. 2011)

Ensemble works

Christopher Adler, *Diomedea*, for khaen and harp (2017)

Christopher Adler, *Three Body Problem*, for khaen and cello (1999)

Christopher Adler, *Three Lai*, for khaen, violin, and viola (1996)

Sidney Marquez Boquiren, *Babaylan*, for khaen, flute and cello (2011)

David Loeb, *Three Friends of Winter*, for khaen, flute, guitar, cello and percussion (2004)

David Loeb, *The Maltese Plaza in Fog*, for three khaen (2010)

Recordings

Recordings and videos of many of the above pieces may be found on christopheradler.com/khaen.html

Compact discs available are:

Christopher Adler, *Epilogue for a Dark Day* (compact disc, Tzadik TZ 8004)
includes *Epilogue for a Dark Day*, *Three Lai* and *the wind blows inside*

David Loeb, *The Silent Waterfall* (compact disc, Vienna Modern Masters VMM2048)
includes *Kawagiri: Rivermist in Summer*

David Loeb, *A Forest of Verses* (compact disc, Vienna Modern Masters VMM2054)
includes *Karin* and *Three Friends of Winter*

David Loeb, *Travelogue: Music of David Loeb* (compact disc, Centaur Records)
includes *The Maltese Plaza in Fog*