The Mondulkiri Font Family

Khmer Mondulkiri

A very fine font with separately designed shapes for italics, bold and bold italics.

ព្រះជាម្ចាស់ស្រឡាញ់មនុស្សលោកខ្លាំងណាស់ aA

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Khmer Busra

This is probably the best font for books. The font has separately designed shapes for italics, bold and bold italics. This font was formerly named 'Khmer Mondulkiri book'. The name change was mainly due to the fact that the font name was too long for some programs.

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Khmer Oureang

A very bold font. This font was formerly named 'Khmer Mondulkiri ultra'.

ព្រះជាម្ចាស់ស្រឡាញ់មនុស្សលោកខ្លាំងណាស់ aA

Khmer Mondulkiri semibold

This font is no longer available as separate font, it has been replaced by 'Busra bold'.

Khmer Busra dict

This font has alternative shapes for four of the Khmer letters as they are found in some dictionaries. Otherwise it is identical to the Busra font.

Busra	Busra dict
ឩ ឌ ព័ន្ធ ពណ៌	ឩ ឌ ព័ន្ធ ពណ៌

Khmer Busra xspace and Khmer Busra diagnostic

This font makes a number of otherwise invisible or not easily visible characters visible. However, many word processors and editors take charge of some or all of these characters and do not display them in the way they are provided in the font. It does work very well in Notepad. Also the Uniscribe engine executing the special instructions for Unicode sometimes decides that some of the code in the font should not be executed if one of these characters is not next to a Khmer character. Otherwise this font is identical to the Busra font.

These characters are: space, all typographical spaces (U+2002-200A), zero-width-space, zero-width-non-joiner (zwnj) and zero-width-joiner (zwj). All Mondulkiri series fonts contain all of these typographical spaces.

ក ក ក ក ក ក ក កក កកកកក

The image below renders the above line in 'Khmer Busra xspace':

Khmer Busra diagnostic does the same as Khmer Busra xspace, but also adds dotted circles before coengs if they follow a vowel as well as in between multiple above-symbols. Both of these character sequences are permitted in Windows, but the former is often a missspelling and the latter is also usually unintended and a missspelling as well as not being permitted in other operating systems (see below). In this way the font helps to spot common typos.

Busra	Busra diagnostic
កំ ញ ធើ	កំ◌̊◌̊_៣◌្◌_ធើ◌

Khmer Busra Bunong

This font has a lower line height. Some coengs or vowels under coengs may not display on screen or touch the top character of the next line. If any parts are clipped on the screen they should, however, be visible in print. It will provide more lines of text on a given page. In all other respects this font is identical to the 'Khmer Mondulkiri book' font. Please see table under 'Khmer Busra high'.

Khmer Busra high

This font has a higher line height in order to accommodate some rare Khmer words on screen. Please observe the ◌̊ above the vowel in last word in the example below, it is present in all three examples, but totally invisible on screen with Busra Bunong. These words will still be printed correctly in the other fonts, but these parts may invade the space below the row above and these parts may not be visible on screen.

In print:

Busra	Busra Bunong	Busra high
ព្រះជាម្ចាស់ស្រឡាញ់មនុស្សលោកខ្លាំងណាស់ ធ្វើ៎	ព្រះជាម្ចាស់ស្រឡាញ់មនុស្សលោកខ្លាំងណាស់ ធ្វើ៎	ព្រះជាម្ចាស់ស្រឡាញ់មនុស្សលោកខ្លាំងណាស់ ធ្វើ៎

On screen:

Busra	Busra Bunong	Busra high
ព្រះជាម្ចាស់ស្រឡាញ់មនុស្សលោកខ្លាំងណាស់ អ្នី៖	ព្រះជាម្ចាស់ស្រឡាញ់មនុស្សលោកខ្លាំងណាស់ អ្នី៖	ព្រះជាម្ចាស់ស្រឡាញ់មនុស្សលោកខ្លាំងណាស់ អ្នី៖

Khmer Busra dot

This font does something that a Unicode font should not do and that is it does not show the 'correct' symbol for one particular Unicode codepoint. It shows a dotted circle ◌ in the place where a ក should be shown. It may be used for didactic purposes. This is to circumvent a particular limitation of the Microsoft Unicode implementation that does not permit some Khmer symbols to stand on their own together with another character:

Khmer Busra	Khmer Busra dot
◌ុ ◌ំ	◌ុំ (= ក + ◌ុ + ◌ំ)

This font is **not** suited for displaying any Khmer text.

Khmer Busra MOE

This font drops a below-vowel in a cluster containing a coeng-Ro.

Khmer Busra	Khmer Busra MOE
គ្រួសារ	គ្រួសារ

Khmer Ratanakiri

This is a Khmer Mool (or Muol or Muul) font. At this point of time most ligatures have not yet been implemented. Some coengs of independent vowels and other features used only infrequently in normal Khmer text are currently still implemented in a different character style. This font does not support more than one below-coeng, i.e. words like លក្ស្ណៈ cannot be written in it.
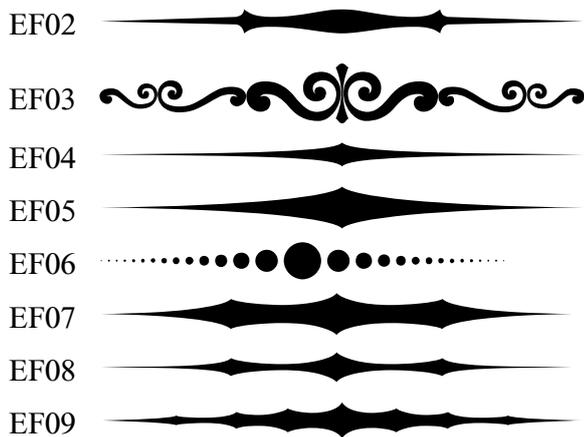
ព្រះជាម្ចាស់ស្រឡាញ់មនុស្សលោកខ្លាំងណាស់ aA

Miscellanious matters

Paragraph art

Many of the above fonts contain some paragraph separator art:

EF00 ═══════◄◦◦►═══════

EF01 ═══════◄◦◦►═══════

EF02	⸻◆━━⬥━━◆⸻
EF03	∽∾∽╌∾╌∽∾∽
EF04	━━◆━━
EF05	◆
EF06	·········•••●•••········
EF07	◆◆◆
EF08	◆◆◆◆
EF09	━◆◆◆◆━

To use these characters in Microsoft Word first select e.g. 'Khmer Mondulkiri' , then type the four character code at the start of one of the lines above and press Alt-x, then select the line and open the paragraph formatting to select e.g. a line spacing of 'exactly' 16 point. Finally, make sure the symbol is selected und chose a character size of e.g. 144 (as in the example above). The symbol EF03 needs a higher line spacing than the others to display completely.

These characters or line art are **not** part of Unicode and fonts from other sources will not have them.

Other characters

The Mondulkiri fonts contain all basic Latin characters. They also contain a limited number of characters used in some languages in Vietnam and many phonetic characters. The choice of characters included is based on the personal decision of the designer.

Coeng Da and coeng Ta

Coeng-Da and Coeng-Ta

Coeng-Da and Coeng-Ta theoretically have the same shape in Khmer. In the Mondulkiri fonts they are shaped slightly differently so that there is also a visible difference reflecting the difference in code.

ជ្ដ	ត្ត

Triisap

In order to balance readability and overall height of every line the Triisap () is higher over consonants when Triisap is the only symbol above this consonant and gets moved down slightly when accompanied by an above vowel:

ប៊ី and ប៊ី.

Secondary coengs and other low elements

Some Khmer words have two coengs or a below vowel underneath a coeng. To reduce overall line-height this second level below the main consonants is less tall than the first level.

e.g. ឡ្ង vs. អ្ងី!, សង្ឡ vs. ព្យាករ, ដំឡ្ង vs. ដូរ.

For the same reason there are two different coengs for coeng Nho after Nho:

ញ្ញ   ញ្ញ.

Differences between systems

The implementation of Khmer Unicode differs from font to font and from operating system to operating system.

Multiple symbols

The official description of Khmer Unicode lacks some details hereby leading to some variations in its implementation on different systems. One observed variation is that the Microsoft Windows implementation allows for an unlimited number of above symbols, e.g. Nikahit, while some other implementations e.g. Pango (Linux) in the program 'Lilypond', run under Windows, does not permit it and inserts dotted circles after the first symbol (example 1). Windows permits the Nikahit to be placed before **and** after the vowel Aa while the mentioned Pango implementation does not (example 2). The word in example 3 (a real word) is not permitted in this Pango implementation. This all means that the same text may look differently in different systems or typos invisible on system (as in example 1) may show up very visibly in another.

The Mondukiri fonts try do display multiple above symbols and differentiate between different orders of characters, other fonts, like Khmer Kampot may not.

Every row has the same character sequence in the table cells.

	Khmer Busra (Windows)	Khmer Kampot (Windows)	Khmer Busra under Pango (Lilypond/Windows)
1	កុំ	កំ	កំំំំ
2	កំា កំា	កំា កំា	កំា កំា
3	ទ្មៅ	ទ្មៅ	ទ្មៅ

Permitted order of elements

The Khmer Unicode implementation in Windows permits in a number of cases a variety of different arrangement of the elements without this being evident in the end result. The example below is only one of many. This may not be the case in other implementations.

ស្រ្ដី ស+ុព+ុរ+ី

ស្ត្រី ស+ុរ+ុត+ើ

ស្ត្រី ស+ុ+ើ+ព្រ

ស្ត្រី ស+ព្រ+ើ+ុ

Since coengs are also permitted to occur after vowels to accommodate some old spellings, Nho followed by a coeng can be spelled in two different ways.

ញ្ឡ ញ+ុល

ញ្ឡ ព+ពា+ុល

It might have been better to permit this combination only if the final coeng were preceded by a zero-width-joiner symbol.

Differences between fonts

Ligatures

The kind and range of ligatures (several characters combined in one) can be different in different fonts.

Most common are the following ligatures:

Khmer Busra	Khmer Kampot	Khmer OS
កា មា ច្បា ម៊ី	កា មា ច្បា ម៉ី	កា មា ច្បា ម៉ី

Less common are e.g.

Khmer Hammond	Khmer Kampot	Khmer OS
ដា ប្ហា វា	ជា ថា វា	ជា ថា វា

Ligatures in Mool fonts:

Khmer Ratanakiri	Khmer Mool	Khmer OS Muol
វិ វ៉ិ វ៉ី វ៉ឹ កិ កី កឹ កឺ កា មា	១ វ៊ី វ៊ី វ៊ី កិ កី កឹ កឺ ភា ម	១ វ៊ វ៊ វ៊ ក ក ក ក ភា ម

Shape of Sso, U+179D ម៉ ligated with the vowel Aa ៀ

To the best knowledge of the author this ligature should be ម៉ា and not ប្ហា since, unlike ប+ៀ, this ligature

cannot be confused with ហា.

Positioning of Muusikatoan

Muusikatoan may be placed above the base consonant or above the following vowel Aa.

Khmer Busra	Khmer Kampot	Khmer OS
ម៉ា ច្បៀ ប៉ា	ម៉ា ច្បៀ ប៉ា	ម៉ា ច្បៀ ប៉ា

Positioning of Samyok Sannya

Samyok Sannya may be placed differently by different fonts.

Khmer Busra	Khmer Hammond	Khmer Kampot	Khmer OS
រ័ ព័ ល័ យ័	រ័ ព័ ល័ យ័	រ័ ព័ ល័ យ័	រ័ ព័ ល័ យ័

ZERO-WIDTH-NON-JOINER and ZERO-WIDTH-JOINER

The Mondulkiri fonts make full use of the possibilities provided by the zero-width-non-joiner and zero-width-joiner. The default behaviour of the register shifters Muusikatoan ៉ and Triisap ៊ can be overridden by the use of zero-width-non-joiner (zwnj, U+200C) to prevent it from being moved down and zero-width-joiner (zwj, U+200D) to force it down. This may be particularly useful for didactical purposes.

Normal	With zwnj	Normal	With zwj
ម៉ុ	ម៉ុ	ប៊ិ	ប៊ុ

But it is also important, e.g. to spell one in Cambodia well known name (រង្សី) correctly.

	Normal	With zwj
Khmer Busra	រង្សី	រង្សី
Khmer Kampot	រង្សី	
Khmer OS	រង្សី	

The formation of ligatures can also be hindered with the use of zwnj.

Normal	With zwnj	Normal	With zwnj
កា	កា	ឈា	ឈា
ម៉ី	ម៉ី		

All these functionalities are most likely not found in other fonts.

Narrow above symbols

The Mondulkiri fonts have narrow above vowels and symbols, in particular U+17DD, for the use with Cambodian minority languages. E.g in Bunong (also known as Phnong) sequences like រិ៉ែ and រ៉ិ are frequent.

Vowels after coeng-Ro

Below baseline vowels after coeng-Ro can either be dropped lower or remain directly under the base consonant. Also consonant clusters involving coeng-Ro and a second coeng that reaches to the right of the base consonant can have different implementations.

Khmer Busra	Khmer Kampot	Khmer OS
ក្រូសា	ក្រូសា	ក្រូសា
សង្រ្កួច	សង្រ្កួច	សង្រ្កួច
បញ្រ្កួល	បញ្រ្កួល	បញ្រ្កួល

Register shifters (◌៊ and ◌៉)

Register shifters can move below a letter under certain conditions. The Mondulkiri fonts determine whether a register shifter should move below or not by the character that precedes it directly. The visual result of a word may therefore differ in the presence of a coeng, depending on whether a register shifter is placed before or after the coeng. With the Mondulkiri fonts the opposite behavior can always be achieved by insertion of zwj or zwnj before the vowel as mentioned above.

Khmer Busra	Khmer Kampot	Khmer OS
ម្ងៈ អ្ងៈ ប្ងៈ អុៈសុៈ (ហុិអុិម្ងិម្ងិម្ងិ[1]) ម៉ាំ ប៉ុង	ម្ងៈ អ្ងៈ ប្ងៈ អុៈសុៈ (ហុិអុិម្ងិម្ងិម្ងិ) ម៉ាំ ប៉ុង	ម្ងៈ អ្ងៈ ប្ងៈ អុៈសុៈ (ហុិអុិម្ងិម្ងិម្ងិ) ម៉ាំ ប៉ុង

The Mondulkiri fonts move a register shifter if followed by an above-vowel (◌ិ◌ី◌ឹ◌ឺ), Samyok Sannya (◌៉ និប៉ុង!) or ◌ាំ. The Triisap remains above if it is preceded by a coeng-Ha (◌្ហ) or coeng-Qa (◌្អ).

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[1] In the last two examples the Triisap was placed before the coeng, in the others after the coeng.