The Q International QWERTY Keyboard 19.061

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Introduction to the Q Keyboard

The ***Q*** International QWERTY Keyboard

Revision 19.054

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See note below regarding issues with Microsoft Compiled Help (CHM)

Preface

This document describes the design and operation of the Q International QWERTY Keyboard.

The Q International QWERTY Keyboard operates on standard U.S. QWERTY keyboard devices, augmented with custom-designed keyboard device driver software, running on the Windows operating system. The documentation refers to this as a *software-defined keyboard.*

The design is also easily adapted to proposed keyboard devices having additional, special modifier keys, which increase productivity and compatibility with existing systems. The documentation refers to this as a hardware-defined keyboard. Hardware-defined keyboards do not as yet exist.

The Q International QWERTY Keyboard allows you to type a comprehensive set of international letters, symbols and punctuation, supporting hundreds of Latin-based languages. You can also type Cyrillic-based languages using **Dead Key** and ***Held Key*** letters. This takes some additional effort, but is usable for short passages of text. The Greek alphabet, including monotonic accents, is likewise available using Dead Keys and Held Keys.

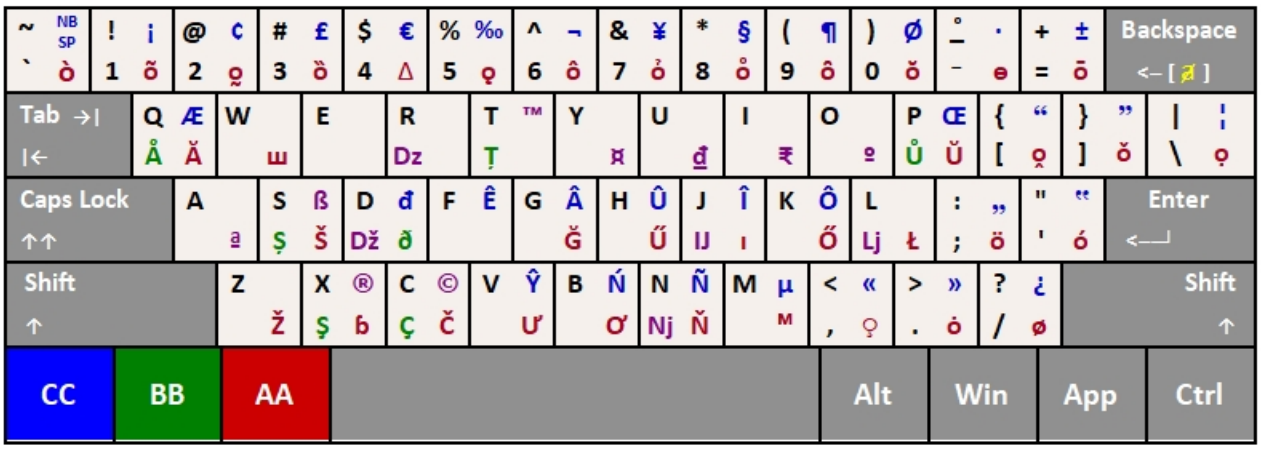
Briefly, the many capabilities of this keyboard come from a unique set of "modifier keys" which replace the **Alt**, **Windows Logo** and **Ctrl** keys on the left side. These modifier keys are known as **AA**, **BB** and **CC** respectively. **AA**, **BB** and **CC** take on a role similar to the **AltGr** key that is present on many international keyboards.

Here is a basic diagram of the keyboard, to help you understand these special modifier

keys. You can also see some of the more important letters and special characters that are available.

For more information on how the Q Keyboard's modifier keys are used, see [Modifier key visual display](#).

QWERTY



The remainder of this document refers to "The Q International QWERTY Keyboard" as "The Q Keyboard" for short.

[Part 1](#) provides an overview of the keyboard's design, and answers to Frequently Asked Questions.

[Part 2](#) provides descriptions and explanations for most of the fundamental Q Keyboard features.

[Part 3](#) provides a graphic diagram of the Q Keyboard with a display of all [Live Keys](#), all [Dead Key](#) accent locations, and summary information on a number of topics.

[Part 4](#) describes a number of additional features of the keyboard, allowing you to type a wide range of characters, many of which are punctuation symbols rather than letters.

[Part 5](#) contains guidelines for using the Q Keyboard with a selected list of languages, and provides comparisons and equivalences to other international keyboards.

[Part 6](#) describes the Q Keyboard's support for Vietnamese.

[Part 7](#) describes the Q Keyboard's support for Cyrillic.

[Part 8](#) contains a detailed description of all of the characters supported on each of the 24 defined Dead Key accent locations. The Dead Key guide also has a list of [Held Keys](#) available for each key. Held Keys are a variation on Dead Keys, which provide access to

additional letters and symbols.

Part 9 contains a detailed list of all known Latin languages that are supported by the Q Keyboard, based on available reference materials. For more information on this topic, see Can the Q Keyboard type every Latin language?

The Appendix at the end of this Help contains an exhaustive list of every letter and symbol on the Q Keyboard, sorted in numeric order by the Unicode value of each character, such as U+00C4 for **Ä**.

Summary

The Q Keyboard defines a unique international keyboard design that is practical and easy to use by typists of many nations and languages. The Q Keyboard device driver allows any compatible U.S. QWERTY keyboard to produce a comprehensive set of international Latin letters, plus many additional types of punctuation and special characters.

The goal of the Q Keyboard is to support all of the major Latin-based languages in current use worldwide. This includes the languages of Western, Central and Eastern Europe, Latin languages throughout the Americas, Australian and Polynesian languages, African languages and some that have been Romanized from Cyrillic. Because the design begins with the U.S. QWERTY keyboard layout, it is not biased for or against the accented letters of any particular language or region. The keyboard is also capable of producing all letters appearing in modern Cyrillic-based languages. The Cyrillic feature uses Dead Keys and Held Keys only, rather than Live Keys, and is thus appropriate mostly for short passages.

Extensive efforts were made to be fair and balanced in terms of accessibility and ergonomics. An important design objective was to be consistent in deciding where letters are placed and how they are accessed, when this does not conflict with other goals. The Q Keyboard has been validated against a list of hundreds of Latin-based languages to confirm its applicability, correctness and ease of use. (See Language statistics for more information.) Many users should find it to be practical and beneficial.

As a new technology, the software comprising The Q International QWERTY Keyboard is subject to revision, to support new requirements and to correct any errors or omissions which may be discovered in the software or its documentation. As with any human endeavor, the Q Keyboard cannot be guaranteed to be error-free. It has, however, been thoroughly tested and reviewed several times. As of the time of its release, there are no known issues with the Q Keyboard that have not been discovered and documented. The most significant outstanding issue deals with **N-Key Rollover**, which is documented here. (This is not an error *per se*, but is an operational characteristic that users should be aware of.)

Because this document has been extensively reviewed and edited, any typographical errors that may remain are likely to be minor ones, which would not materially affect the

description of the Q Keyboard's features or its operation.

One way that care was exercised in the preparation of this document is by **validating** it. The documentation is "validated" by typing into a temporary copy of it while the Q Keyboard software is enabled. Wherever a Help article discusses a key sequence to produce some letter, that key sequence is actually typed in-place into the text of the temporary copy, right where it is described, following the same steps that you would do when you read the instructions for typing some letter. This helps confirm that the Q Keyboard actually does what the documentation **claims** that it does.

As with any software embodying thousands of individual definitions, discrepancies may occasionally turn up, and if they do, these get corrected. Most discrepancies that were found during the review process involved the documentation not reflecting the most recent definition of the keyboard software, rather than errors in the design of the software itself. Either way, these errors are corrected. So, in a manner of speaking, not only is the keyboard itself tested, but the documentation is also tested.

Notes:

1. "The *Q* International QWERTY Keyboard", as a description of this software, is not currently cleared for trademark usage, and is subject to change.

2. The Q International QWERTY Keyboard has no relationship to the company "IQ Technology, Inc." or its product known as the "IQQI Keyboard".

3. Nothing inherent in the design precludes the Q Keyboard technology from potentially being adapted to non-Windows systems. The initial design of the Q Keyboard does not currently address this.

Note about Microsoft Compiled Help (CHM) and Windows 10

Be aware that testing has found that when the CHM version of this Q Keyboard Help document is displayed on a Windows 10 system, if the default Internet browser is Microsoft Internet Explorer 11, a problem may occur in which external hyperlinks do not function. If you click on a link that navigates to some other location in the Help, it works

correctly, but if you were to click on a link to an external web page (like an explanatory Wikipedia article), the 'jump' to the associated web page will not occur. This issue did not exist under Windows 7.

There are a few ways to overcome this. First, you could make some other browser the default one. In testing, when the default browser was set to Opera, this hyperlink problem did not happen.

Second, you could replace the default CHM viewer with a third-party product. One freeware package that worked correctly in testing was SumatraPDF. There are other free and paid products that provide similar capabilities.

Finally, you could use the PDF version of the Q Keyboard Help instead of CHM. The PDF Help does not exhibit this hyperlink problem.

The ***Q*** International QWERTY Keyboard

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The Q Keyboard user community is supported by the online forum located at
http://qKeyboard.proboards.com

Revision history

Rev.	Date	Remarks
19.061	2019-03-02	Repaired some non-functioning hyperlinks in document Editorial clarifications and corrections Software unchanged from 19.054 level
19.054	2019-02-23	Change Dead AA / Spacebar from undefined to U+2215 Division Slash Change Live AB ` from U+01F5 Latin Small Letter G with Acute to U+0268 Latin Small Letter I with Stroke Change Live BC ` from U+01F4 Latin Capital Letter G with Acute to U+0197 Latin Capital Letter I with Stroke Part 4, Additional Features, now in alphabetical order by article title Correction to Double Acute dead key description in Keyboard Guides Correction to letters listed in Serbo-Croatian article Corrections to diacritic key sequences in Dead Key Guide Improved discussion on typing accented Greek Upsilon and Iota Improved discussion of Quotes and related symbols Explanation for beginners on how Unicode uses combining modifiers Note about adding combining accents to digraphs Editorial clarifications and corrections
19.047	2019-02-16	Correction to key sequence documented for **C̲ Kyrgyzstani Som** currency Correction to key sequence documented for **⌘ Place of Interest Sign** Simplified revision number format for all software and documentation Editorial clarifications and corrections
19.040	2019-02-09	Addition of convenience Cyrillic letters **ь Ь** on **AA 7 6** Removal of redundant Cyrillic letters **ы Ы ӹ Ӹ** from **AA \ 6** New versions of BabelPad and BabelMap bundled software Correction to link for DejaVu font download Clarification on font licensing issues Note about support for **(ɔ)** CopyLeft symbol Minor editorial corrections
19.036	2019-02-05	Clarification that Multiplication symbol **×** on key **X** is ***Held AL X*** Clarification on use of Scandinavian letters for **Sámi** languages Letters **ő Ő** and **ű Ű** no longer considered **Convenience Keys** Corrections to documentation of keys for … and ' symbols Other minor editorial corrections
19.030	2019-01-20	Documentation correction for **Small capitals** article
19.028	2019-01-28	Modification to Double Acute/Grave handling: Letters **ő Ő** and **ű Ű** now on **Dead AA 3 O** and **Dead AA 3 U** Letters **ȍ Ȍ** and **ȕ Ȕ** now on ***Held AA 3 O*** and ***Held AA 3 U*** Correction to mapping of Print Screen key

		Revision of Copyright terms
18.251	2018-09-08	Public release

Your assistance is welcomed

Your assistance is welcomed in helping to make the Q Keyboard better. How so?

First, you will quickly see that this document is large, encompassing over 190 articles that span some 700 pages in the PDF version. As shown under Q Keyboard statistics, there are over 2,400 unique characters you can type. Researching and compiling this information has taken three years.

With that much detail involved, discrepancies can crop up, no matter how carefully it is reviewed, validated and scrutinized. In the course of using this Help document, should you find any issues, whether these be keyboard design errors, inaccuracies regarding the description of any letter or language, or just typos, please forward that information to the author. If there are discrepancies between what appears in the Dead Key guides and the rest of the Help, the Dead Key guides should be considered the most authoritative, as the Dead Key Guide is updated first in response to any changes in the keyboard design.

Every effort will be made to ensure this documentation is as accurate and helpful as possible. Your contributions to further that goal will be greatly appreciated.

Second, as you gain experience with it, you may have ideas of your own how the Q Keyboard could be made better. Maybe some useful or favorite symbol was omitted, or perhaps you wish a character could be typed differently to make it easier.

Your ideas and comments are welcomed. Because the Q Keyboard defines such a large number of characters, there is limited room left to add more, so requests for new symbols will have to be weighed carefully. Be assured that all well thought-out ideas and requests will be considered.

In writing a lengthy document that may be seen by persons of many different countries, languages and cultures, it is possible for innocent remarks to be inadvertently taken as culturally insensitive by some readers. Great care was taken in trying to avoid such a thing, but should you have concerns about anything written in this document, you are invited to forward your comments to the author for review.

Copyright issues

The Q International QWERTY Keyboard is the copyrighted work of the author. The software and its documentation are being released to the public without charge, ***for personal and individual use***.

Important: Review the next section for a discussion of Copyright expiration.

The most significant restriction is that hardware and software vendors are prohibited from using the specifications in this document to manufacture a hardware-defined Q Keyboard or to create derivative works, unless they obtain prior written permission from the author. Contact information may be found on the first page of this document.

Why is this restriction imposed? ***Individuals*** are permitted - and welcomed - to freely benefit from the Q Keyboard technology. However, ***manufacturers*** that might apply this technology to create and distribute products ***for sale*** would be making a profit from it, and the author has a proper expectation to be compensated by such businesses for the time, effort and money that has been invested in making the Q Keyboard a reality.

Can users reverse-engineer the Q Keyboard and/or use it to make derivative works?

There is no practical way the author can effectively prevent an ambitious and determined user from doing that, but I really wish you wouldn't.

First, reverse-engineering is a form of plagiarism, and no author likes to be plagiarized. As noted above, creating derivative works, when done by a hardware or software manufacturer, would be in violation of the Q Keyboard copyright.

Second, if you did that, and if you distributed your modified version(s), and if these were then to become widely used, it could confuse people. It would no longer be a case of asking if the Q keyboard software had been installed on a particular computer, but "which one" and "whose version"? That would cause support for the Q Keyboard user community to become divided and fragmented. That would be unfortunate. Unauthorized derivative works would make use of the keyboard uncertain and frustrating, especially when multiple users (perhaps working in different countries) tried to collaborate, and found that their keyboard software was inconsistent and incompatible.

For ambitious users that want more features added to the Q keyboard, I ask that you "work within the system". Instead of creating unauthorized derivative versions, be a part of the Q Keyboard online community, and provide your feedback on revisions and new features you would like to see adopted. If they provide benefits to enough users, and do not conflict with the existing design, I am more than willing to consider them.

For groups requiring some customization that is outside a standard released version, and perhaps is not necessarily applicable to all users, the author is open to consider creating Private Variant Layouts. This concept is discussed in the article Regional Layout Variants. A nominal fee would be expected for this customization work, which would be determined based on the degree of difficulty involved.

For further information on this, please contact the author at info@qKeyboard.com.

Keep in mind that the Q Keyboard is resource-constrained, so there is a limit to how many new features can be added. All well thought-out suggestions will be considered.

The Q Keyboard user community is supported by the online forum located at
http://qKeyboard.proboards.com

Copyright expiration

With the 2019-01-28 release (Revision 19.028) of the Q Keyboard, the following changes to the terms of the Q Keyboard copyright are now in effect:

As of January 1, 2020, the author will release the Q Keyboard software, documentation and design concepts from any and all copyrights, and from that date onward, the Q Keyboard will be considered in the public domain.

Once in the public domain, anyone that wishes may use these materials for any desired purpose, without obligations of any sort towards the author, provided that any use of these materials (other than as an ordinary end-user) must publicly acknowledge and credit the author for these works.

This step is being taken to ensure the widest possible distribution of the Q Keyboard, so that the most people can receive the most benefit from it.

When the Q Keyboard is in the public domain, contact information found elsewhere in this document may no longer be actively supported or available. If this happens and you need assistance, you should contact the distributor where this software was obtained from, to see what support may be available at that time. You might also find assistance from other users on the Q Keyboard forum. See the Home page for more information.

If you wish to modify the Q Keyboard software **after** it is in the public domain (***but not before then***), be aware that the Q Keyboard was developed with a design product called **KbdEdit**, from a company called **KbdSoft**. Their web site is at http://www.kbdedit.com.

Dexterity requirements

The many features of the Q Keyboard are made possible through the use of its unique Modifier Keys known as **AA**, **BB** and **CC** as discussed in this article. For more information on how the Q Keyboard's modifier keys are used, see Modifier key visual display.

Using these modifier keys may require more manual dexterity than you are accustomed to on a typical keyboard.

For instance, when a modifier like **CC** is used with Shift (shown in this Help with the notation **CU**) or when two modifier keys are combined like **AA** and **BB** (shown as **AB**) you would have to hold two modifier keys with one hand, and type the letter key with the other hand.

For upper-case Dead Key and Held Key characters, you would have to hold **AA+**Shift (shown as **AU**) with one hand, and type the accent key and then the letter key with the other hand. For lower-case, only **AA** must be held (often shown with the notation **AL**).

When using Hyper Keys (a type of Live Key), you would have to hold **AA+BB+CC** (shown as **ABC**) or **BB+CC+**Shift (shown as **BCU**) with one hand, and type the letter key with the other hand. Hyper keys are not often needed, and if holding three modifiers is too hard, you can still use the rest of the keyboard if you can hold at least two modifier keys at once.

> **This is not a one-handed keyboard, and there is no feasible way to operate it as such**.
>
> **If you cannot type with two hands, or lack the strength and dexterity to carry out the specific kinds of keying actions noted above, you would be unable to use the Q Keyboard**.
>
> This is a limitation inherent in the design that cannot be changed.

The author cannot confirm or vouch for auxiliary methods, such as additional software layers or "sticky keys" that might theoretically make one-handed operation possible. It is unknown if any such techniques from third-party software vendors are compatible with the technology behind the extended modifier keys present on the Q Keyboard. Testing has confirmed that the "stick key" feature built into Windows will ***not*** allow the **AA**, **BB** and **CC** modifier keys to be "sticky" in that way.

> Such "sticky key" software would likely get confused by having the original Alt, Windows Logo and Ctrl keys "remapped" to their new roles as AA, BB and CC, and would not recognize that altered functionality.

Some users of international keyboards with **AltGr** keys may have experience with similar typing requirements (such as needing to hold **AltGr+**Shift while typing an upper-case accented letter) but because the Q Keyboard has three modifier keys instead of just one,

the occasional extra effort may mean that persons with physical limitations cannot access all of the available letters and symbols.

If you are a person with dexterity issues and you endeavor to use keyboards in spite of that, you are to be commended for your determination and perseverance. Regrettably, the author does not know how to overcome this design limitation in a way that could retain all of the Q Keyboard's current functionality and benefits.

In theory, it might be possible to create a touch-screen device that embodied the concepts of the Q Keyboard, one that was designed from the ground up to address the needs of those with dexterity issues. It might also be possible for a software engineer to create a custom "sticky key" system utility that was specifically designed to work with the Q Keyboard. It might further be possible to create a mechanical device that were able to independently press, hold and release the AA, BB, CC and Shift keys, so that other data keys could be separately pressed (almost as if they were "mechanical fingers"). It might fit over the lower-left part of the keyboard, and would be used by persons with severe physical limitations, such as those only able to press one key at any given time. Such hypothetical software and devices are beyond the scope of the current project and outside the author's area of expertise. Perhaps one or more creative and motivated persons might find a way to make such things a reality.

> All keyboards have a Caps Lock key that will "toggle". That is, when you press and release it, it retains its "state" - either on or off - until you press it again. If AA, BB and CC could be made to "toggle" in that way, it would solve the problem. Regrettably, current technology does allow for any arbitrary key to be "toggled", but only ones where this behavior was already accounted for. So, we cannot make AA, BB and CC into toggled modifier keys.

If you have any suggestions in this regard that could be used to improve a future revision of the Q Keyboard, your comments are welcomed by email at info@qKeyboard.com.

The Q Keyboard user community is supported by the online forum located at
http://qKeyboard.proboards.com

Understanding modifier key notation

Throughout this document, you will find notation describing the use of the Q Keyboard's unique modifier keys known as **AA**, **BB** and **CC**.

For more information on how the Q Keyboard's modifier keys are used, see Modifier key visual display.

Modifier keys are discussed in depth in these articles:

- How can the Q Keyboard do what others have not?
- Why are three modifier keys needed?
- Modifier Keys AA, BB and CC
- Why the names AA, BB and CC?
- Live Key Chords
- Capitalization rules
- Held Keys

See note below about special Dead Key sequences **AL/BL** and **AL/CL**.

See also note below about digit Zero vs. letter O.

Here is a brief summary:

- **AA**, **BB** and **CC** are "modifier keys" in the same sense that Shift and Ctrl are modifier keys.

- **AA**, **BB** and **CC** can be combined with Shift, or sometimes with each other.

- The Q Keyboard does not use or have an **AltGr** key.

- On a *software-defined keyboard*, **AA**, **BB** and **CC** will be a set of existing **Alt**, **Windows Logo** and **Ctrl** keys that get repurposed to become the special Q Keyboard modifiers.

  The present keyboard only supports the Alt, Windows Logo and Ctrl keys on the ***left side***, to simplify the design and reduce the number of supported variations. Earlier versions of the Q Keyboard were more flexible about this, but testing revealed that putting AA, BB and CC on the ***right side*** was not as practical and resulted in some design problems. This issue may be revisited in a future revision of the keyboard.

- On a full-size hardware-defined keyboard, there would be two sets of discrete modifier keys, one set on each side, labeled as **AA**, **BB** and **CC**. On a compact or laptop-based hardware-defined keyboard, there would likely be just one set of discrete modifier keys, labeled as **AA**, **BB** and **CC**, due to space constraints. Hardware-defined keyboards do not as yet exist.

Because spelling out all possible combinations of modifiers and Shift keys would be cumbersome and make the Help explanations wordy and hard to read, a **short-form notation is used** to allow the documentation be more concise.

These keys are sometimes shown as color-coded in ***tables***, to help distinguish them. You will see this color coding in the display of Live keys in the articles Live Key List and Part 3: Keyboard Layout for Live Keys.

Short Form notation	Description
AL	**AA** key *alone* (the **L** indicates Lower case) - see ***Note*** below
AU	**AA** + Shift key (the **U** indicates Upper case) - see ***Note*** Below
BL	**BB** *alone*
BU	**BB** + Shift
CL	**CC** *alone*
CU	**CC** + Shift
AB	**AA** + **BB**
BC	**BB** + **CC**
AC	**AA** + **CC**
ABC	**AA** + **BB** + **CC** (called a *Hyper Key*)
BCU	**BB** + **CC** + Shift (a *Hyper Key* or *Hyper Shift*)

When **BB** (also **BL** and **BU**) and **CC** (also **CL** and **CU**) appear in the documentation (***other*** than in tables) to describe a key sequence, they normally appear in blue. When the keys are being discussed in a ***general sense*** rather that discussing a key sequence, the coloring may be omitted. Combinations of AA, BB and CC also normally appear in blue: **AB**, **BC**, **AC**, **ABC** and **BCU**.

Note the special case of **AA**

Modifier **AA** is often used like **AltGr** on other keyboards, to begin a **Dead Key** sequence. It can ***also*** be used for ***Held Key*** letters, and a number of **Live Key** letters. For example:

- **Dead Key ø Ø** is on **AA / O**, where **ø** is on **AL / O** and **Ø** is on **AU / O**
- **Held Key ǿ Ǿ** is on ***AA / O***, where **ǿ** is on **AL / O** and **Ǿ** is on **AU / O**
- **Live Key ö Ö** is on **AA O,** where **ö** is on **AL O** and **Ö** is on **AU O**

In the documentation, these various uses each have their own color codes to distinguish these three cases:

AA notation	Description	Used as
AA	**AA** key *alone*, in a general sense	**Dead Key**
AL	**AA** key *alone*, emphasizing **Lower** case	**Dead Key**
AU	**AA** + Shift, emphasizing **Upper** case	**Dead Key**
AA	**AA** key *alone*, in a general sense	***Held Key***
AL	**AA** key *alone*, emphasizing **Lower** case	***Held Key***
AU	**AA** + Shift, emphasizing **Upper** case	***Held Key***
AA	**AA** key *alone*, in a general sense	**Live Key**
AL	**AA** key *alone*, emphasizing **Lower** case	**Live Key**
AU	**AA** + Shift, emphasizing **Upper** case	**Live Key**

Whenever you see a modifier key described as **CC** rather than as **CL** or **CU**, it means that the modifier key (such as **CC**) is being discussed in a ***general sense*** which applies **both** to upper and lower case. In other words, **CC** often means **both CL** and **CU**, whichever is applicable. (The same comments also apply to **AA** and **BB**.)

> For example, we can make the statement that "**E with Acute** can be typed with **CC E**". This is a ***general***, ***shorthand*** way of saying that you would use **CL E** (that is, **CC** *alone* + **E**) to type a lower-case **é** with Acute, ***and*** **CU E** (that is, **CC** + Shift + **E**) to type an upper-case **É** with Acute.

Being able to describe these things in a general, shorthand way allows us to explain matters without having to belabor these details over and over. That allows us to make the documentation a bit shorter and easier to read than would be the case if this shorthand was not used.

To distinguish a "***Held Key***" from a "**Dead Key**", Held Key notation usually appears like ***AA 8 A*** using ***bold italic red*** font, while **Dead Key notation** is just bolded like **AA 8 A**.

> In this example, **Dead Key AA 8 A** (without shift) produces **å** with Ring Above, while ***Held Key AA 8 A*** produces **ạ̊** with Ring Below. Since these are **lower-case** letters, the convention is to use **AL** rather than **AA**, which gives us **Dead Key AL 8 A** and ***Held Key AL 8 A***. To be brief, the word "Key" may sometimes be omitted, and then these keys would be described simply as **Dead AL 8 A** or ***Held AL 8 A***.

When a **Live Key** is being discussed, it is usually shown in **blue**. So, you will see comments like "The Florin currency symbol **ƒ** is on **Live Key AC F**."

Special key sequences **AL/BL** and **AL/CL**

In a few cases, it is necessary to extend the capabilities of dead keys beyond conventional **Dead AL** and ***Held AL*** usage. This is done when the Q Keyboard defines Secondary Literal symbols, and for Bidirectional Text codes.

To type these extended characters, you must first hold **AL** and type one of the 24 Dead Key locations. Then, you release **AL** and the dead key, hold **BL** or **CL**, and type a second key as required.

Because this is different from how other keys are typed, a unique notation is used. When an **AL** dead key is typed and then followed by a **BL** or **CL** key, we show this as **AL x BL y** or **AL x CL y** where **x** and **y** are the specific keys you need, and a point is made of showing **BL** in **green**. Unlike regular dead keys defined in this Help document, the words "Dead" or "Dead Key" are omitted. The fact that **AL** is shown in black *implies* that it is typed like a **Dead Key**, not as a ***Held Key***. These special sequences do not use Shift, so you will not see notations with **AU**, **BU** or **CU**.

These key sequences are not difficult to type, though they may take a bit longer than typical keys on the Q Keyboard. Only 24 such keys are defined, and you will probably not need them very often.

Examples:

The Bidirectional code **LRM** (Left to Right Mark) is typed as **AL X CL M**
The Secondary Literal code **Modifier Letter Low Ring** is typed as **AL 8 BL 8**

Note about the use of digit zero vs. letter O

In some cases, it is important to distinguish whether the digit **0** key or the letter **O** key is being discussed as part of some **key sequence**, since the characters **0** and **O** look similar.

When the context is not enough to make this clear, the **digit 0** is rendered as **0** using a **font** that adds a **slash** to the Zero, while the appearance of the **letter O** is not modified.

> Do not confuse how this font puts a slash in the digit **0** with the ***unrelated*** (but similar) Scandinavian letter **ø Ø with Slash Stroke**. On most keyboards, digit **0** will not have this slash on the keycap legend. You would most likely see a zero-with-slash character in fixed-width fonts used by programmers and other IT workers.

Additionally, when there is room for it, the phrase "(zero)" is included to give emphasis. Thus, you may see key descriptions like this:

- **Live Key CL 0** (zero) has **ø**
- **Live Key CL O** has **ó**

The main thing to remember is that this **0** notation is being used to describe the zero ***key***, not some ***character*** with a slash in it. U.S. keyboards do not normally show a **key** with a slash in it, and even if they did, it would be the **zero key**. (It is true that some Scandinavian keyboards may actually have a **Ø** key, but the Q Keyboard software does not support such devices.)

Relating accents and dead keys

One of the challenges in creating the Q Keyboard was devising a strategy for associating the many required accents with the available keys on a standard U.S. QWERTY keyboard, doing so in a way that makes sense and can be remembered.

When hardware-defined Q Keyboard devices become available, the various Dead Key accents will have preprinted keycap legends, resolving the problem that way. At present, existing QWERTY keyboards with conventional keycaps will be used, so some other solution is needed.

> It might be possible for individuals to place stickers or "dry transfer lettering" on selected QWERTY keys as helpful labels. If you did this, the keys that might most benefit from this are the ones described as the Southwest Vowel keys and/or the Northwest Vowel keys. This may or may not be practical, since such lettering might detach from the keys or wear off. You would have to experiment with these or other labeling techniques to see if they worked for you.

The Q Keyboard has 24 locations for its Dead Keys, out of 47 available data keys (those being the 26 letters, 10 digits and 11 punctuation keys, with Spacebar as key 48). Since Dead Keys will be used frequently, and not all are hard to remember, learning them should not be too difficult. Each Dead Key description, as found in the Dead Key Guide, explains how you can remember them. A few, like the \ Backslash key used for Dot Below, were assigned arbitrarily and have no good rules to remember them by. You'll just have to learn them "the hard way". Fortunately, there are only a few keys that are "hard" like that. For instance, if you have a need to frequently type Dot Below letters, it will not take very long for you to remember that the \ Backslash key is the one you want.

Here is a summary of all the Dead Key locations, what they are used for, and how to remember them.

Key	Accent	Description	How to remember
`~	`	Grave	Accent quote ` closely resembles diacritic
1!	˜	Tilde Above	1 key is next to `~ key that has ~ symbol
2@	˜	Tilde Below	Tilde Below is second (2) kind of Tilde accent
3#	˝	Double Acute and Double Grave	Relate two lines of ˝ Double Acute and ‵ Double Grave with || within # symbol
4$	n/a	Greek	Character 4 is similar in shape to Greek letter Δ Delta
5%	˛	Ogonek	Pun: Associate two ° parts of % with O letters in Ogonek
6^	ˆ	Circumflex Above	Character ^ closely resembles diacritic
7&	ˀ	Hook Above	Character 7 somewhat resembles diacritic

8*	°	Ring Above	Round shape of * character somewhat resembles diacritic
9(	ˆ	Inverted Breve	Character (when rotated a quarter turn resembles diacritic
0)	˘	Breve	Character) when rotated a quarter turn resembles diacritic
-	–	Dash Stroke	Character – closely resembles diacritic
=	¯	Macron and Line Below	Two lines in = are reminder of Macron Above and Below
W	n/a	Cyrillic	Remember 'hard way' with practice and use
[	ˏ	Circumflex below	Character [when rotated a quarter turn resembles diacritic
]	ˇ	Caron	Character] when rotated a quarter turn resembles diacritic
\	ˍ	Dot Below	Remember 'hard way' with practice and use
; :	¨	Diaeresis	Character : when rotated a quarter turn resembles diacritic
' "	´	Acute	Apostrophe ' resembles diacritic
X	n/a	Extra	Remember "x" in Extra
M	n/a	Miscellaneous	Remember "m" in Miscellaneous (and, Modifier)
,	¸	Cedilla	Comma , resembles diacritic
.	˙	Dot Above	Period . when raised closely resembles diacritic
/	⁄	Slash Stroke	Slash / closely resembles diacritic

The Quarter Turn Clockwise Rule helps relate accents to keys

Some accents resemble existing QWERTY characters, except that they have a different orientation. For instance, the **Breve** accent ˘ resembles a parenthesis. There is a similar-looking **Inverted Breve** ˆ that ***also*** resembles a parenthesis. We would like to use the existing parenthesis keys (that is, the symbols above the **9** and **0** keys) for these accents. But, which accent goes on which key? It seems like either key could work for either purpose. We need a consistent way to do this that is easy to remember.

The approach taken is that, whenever the legend on a key could represent more than one accent or other character - but its orientation is not "turned correctly" - imagine that the legend on the key is **turned 90° clockwise**. In this example, it means that the **(** on the **9** key is **rotated a quarter-turn clockwise** to become the **Inverted Breve** ˆ shape, and the **)** on the **0** key is likewise rotated a quarter-turn clockwise to become the **Breve** ˘ shape.

> To help you visualize this, if you have a detached keyboard, or have a moment to view your keyboard appropriately, orient it so that the **left** side with **Q**, **A** and **Z** is on **top**. Now, look at the **9** and **0** keys, and observe how the parenthesis symbols on them appear on the keycaps. That is how you know which key is for which purpose.

The Q Keyboard uses the Quarter Turn Clockwise Rule consistently any time accents or other symbols are associated with the **( ) [ ] < >** and **:** keys.

For instance, there are various sets of "arrow" and "arrowhead" symbols that point in four directions. For the symbols that point left and right, the **<** key is used for left-pointing symbols, and the **>** key is used for right-pointing symbols. For upward- and downward-pointing symbols, imagine the **<** and **>** keys are rotated a quarter turn clockwise, so that the **<** key is used for the **^** symbol and likewise the **>** key is used for the **ˇ** symbol.

For symbols that resemble various orientations of the letter **T** (like "Tack" characters) that are assigned to **brackets**, the **[ ]** bracket keys may be thought of as if the "top bar" of the T, which may be easier to remember if you visualize the letter **T** in a serif font like **Times New Roman**. The same quarter-turn-clockwise rule applies.

Use of Dead Keys vs. Held Keys in "corner" symbols

There are a number of characters that come in sets of four, which are being called "corner" symbols. When these are placed on the keyboard, the Quarter Turn Rule does not apply, since their orientation is not defined in the same way as arrow-like symbols. Instead, the following rules are used:

- When a symbol belongs on the **Upper Left**, a **Dead Key** using **[** as the **final** key is used
- When a symbol belongs on the **Upper Right**, a **Dead Key** using **]** as the **final** key is used
- When a symbol belongs on the **Lower Left**, a ***Held Key*** using **[** as the **final** key is used
- When a symbol belongs on the **Lower Right**, a ***Held Key*** using **]** as the **final** key is used

Determining which key symbols is the "accent" symbol

When a key other than a digit key is used for a Dead Key accent, how do you know which of the two punctuation symbols is being referred to? You can refer to the table above or to the articles in the Dead Key Guide, but the short answer is, it's always the ***bottom*** symbol, except for the **;:** key.

- This affects these 11 keys:
  `~ -_ =+ [{]} \| ;: ' " ,< .> /?

- The **bottom** symbol (where the left character of each pair is the "bottom" one) signifies the accent for:
  `~ **-**_ **'** " **,**< **.**> **/**?

- The **bottom** symbol only vaguely implies the accent for:
  =+ [{]}

- The **bottom** symbol provides no easy means to remember it for:
  \|

- The **top** symbol (where the right character of each pair is the "top" one) signifies the

accent for:

; :

Additional points:

- The ` ~ key is used as a **Grave Accent** Dead Key, not a Tilde Dead Key. The **Digit 1** key is used for Tilde.

- The . > key is used for **Dot Above**, even though it might *appear* like the period key was for Dot Below. The Dot Below accent is on the **\ |** key.

- The period key is used for **Dot Above** and **** is used for **Dot Below** - and not the other way around - because the Dot Above accent is used more frequently, on more letters and in more languages, than is Dot Below. Preference was given to Dot Above to be placed on the period key, because that is the easiest to remember between these two keys. This is in keeping with the goal of providing the most benefit to the most people.

Digraphs vs. Ligatures

When the subject of **digraphs** and **ligatures** is considered, these terms can often be confused.

Both words describe a glyph containing a combination of two underlying letters. At issue is how they are combined.

A ***digraph*** is a glyph that has two distinct letters. These letters are not strictly "connected" but they may appear very close together. Examples include **dz dž ij Lj** and **nj**. You could type these letters separately, but many fonts often design them in a way that is more attractive when they are used as single Unicode characters.

> One way that the components of a digraph can appear close without being a single Unicode value is through the use of "kerning" specifications in a particular font. According to Wikipedia, "**kerning** is the process of adjusting the spacing between characters in a proportional font, usually to achieve a visually pleasing result". For instance, the font Calibri implements kerning, so that the letters **A** and **V** typed together appear as **AV**, which ***looks*** like it might be a single glyph, even though it is not.

A ***ligature*** is a glyph in which two previously distinct letters are fused together into one, with no space between them, such as **æ œ ɒ** and **ȝ**.

Depending on the font used, and the kinds of kerning rules it implements, it may not always be clear which is which. For instance, **Æ** is a ligature and **IJ** is a digraph. But, there are typographic symbols like **ff** that look just like two **f** letters close together, and might not be distinguishable from two separate letters **ff** that really ***are*** typed next to each other. (Both an **ff** ligature and two "**f**" letters appear in the sentence above. It is very difficult to tell them apart unless you zoom in and greatly enlarge the size of the display.) In these cases, we take into account the intent of the symbol. Here, the intent is to run them together, without necessarily "fusing" them or distorting their appearance as is done in **Æ** or **Œ**. But in practice, a fusing often does take place in the similar symbols **fi** and **ffi**, where the "dot" of the "i" and the "overhang" of the "f" overlap. So, these symbols are often called ligatures instead of digraphs.

There are a few complicating factors that make this relatively simple explanation not so simple:

1. The Unicode standard is inconsistent. Some glyphs which are actually ligatures are called "digraphs" or even "letters", and some digraphs are called ligatures or may also be called letters. To help overcome this, wherever it is feasible, the true nature of the graphic symbol will be referred to as a "letter", "digraph" or "ligature" as appropriate, to conform to the dictionary definition of the word and the actual appearance of the glyph, rather than the (sometimes inaccurate) description taken from the Unicode standard.

2. The general term "digraph" can be applied to letters in general within a language, without reference to fonts or Unicode. For instance, a language might use the **dz** digraph. In terms of the language definition, it is irrelevant how this symbol is implemented in Unicode or in any other computer representation. It's part of the language. The "**dz**" might be even written by hand, so the question has nothing to do with technology but only about the language itself. Note that in English, there are common digraphs such as **ch**, **sh** and **th**, but there are no Unicode definitions with single characters for these pairs of letters. Perhaps the most significant advantage to using digraphs rather than separate letters is that a digraph cannot be split, whereas separate letters ***can*** be split, something that might occur unintentionally or by mistake.

3. For the Q Keyboard, "digraph" can have also a technical meaning. It is used when a single key generates two or more Unicode code point values. For instance, the **Hyper key ABC :** produces the accented letter **ṅ with Diaeresis** as a "digraph". It is only a digraph in the technical sense that the **letter n** and the **combining Diaeresis** are two Unicode values. It is clearly ***not*** a combination or fusing of two letters.

4. In a few cases, the Q Keyboard does have true digraphs (or trigraphs). One example is the trigraph triple on **Live Key V**, having **c'h C'h** and **C'H** as used in the Breton language. There is also a trigraph containing the Q Keyboard ID string on **Hyper Key BCU =** such as **QIK**.

5. In the Q Keyboard documentation, "**digraph**" is sometimes used in a generic sense to mean ***either*** "digraph" or "trigraph". This is done to simplify explanations and to avoid having to say "**digraph or trigraph**" over and over.

> There are currently no defined sequences ***longer*** than trigraphs. It is possible that a future revision of the Q Keyboard might contain a **tetragraph** (a composite symbol with **four** underlying glyphs) if the special Dutch digraph **IJ with Acute Accents** should be implemented in a different way. It is also possible that the **Q Keyboard ID** string might someday be defined as a tetragraph, though none currently exist.
>
> See Handling of Dutch IJ for more information.

In understanding and using the Q Keyboard, you will have to cope with all these various inconsistent definitions and roles for the terms digraph and ligature.

Accented digraphs

Depending on the font you use, it may be possible to add combining modifiers to a digraph. The most likely candidate for this is the digraph triple **dz Dz DZ**, found on **Live Keys AB R**, **BC R** and **AC R** respectively. These digraphs commonly take two accents in particular, namely the **Acute** and **Caron**. **Dz with Caron** is already present on **Live Keys AB D**, **BC D** and **AC D**, but you may find some instances of **Dz** with a **dot** above the **Z**. You will have to test your fonts to see if adding an accent to a digraph will work and look

attractive. If it won't, you can type these as individual letters, using a plain **d D** followed by a **ź Ź** or **ż Ż**. Examples:

dz' Dz' DZ' dż Dż DŻ

By the way: The word Digraph is easily misspelled as **Diagraph**. A diagraph (a real but uncommon word) is not a letter or symbol, but a device for mechanically reproducing drawings, or a drawing instrument combining a protractor and scale, according to Merriam Webster.

Design notes about ...

This section provides some background on general features of the Q Keyboard.

Unicode

Creating the Q Keyboard would not have been possible without the existence of Unicode.

Unicode is a character set encoding standard that defines a list of thousands of characters, including the alphabets of many languages, as well as digits, punctuation, math symbols, and numerous others. It has a capacity to represent over one million unique symbols, although that many have not been defined yet.

The main point is that every character you type on the Q Keyboard results in a **unique number** - a "Unicode value", also known as a **code point** - being sent to your computer. From there, it is directed to whatever application you are running. The number comprising a Unicode value is normally expressed in hexadecimal ("hex" or base 16) notation, although other representations are sometimes used.

The Unicode standard is administered by the **Unicode Consortium**.
Their web site is at https://www.unicode.org.
A good general introduction to Unicode may be found at
https://en.wikipedia.org/wiki/Unicode.

If you are familiar with the concepts of Unicode, the web sites above are helpful if you needed additional information, and you could skip the remainder of this article.

If you need to type characters not directly supported by the Q Keyboard, the article Can the Q Keyboard type every Latin language? may be helpful.

For those who would like an introduction to the basics, here is an overview of what Unicode is and what it does.

There is a brief explanation of **precomposed vs. combining** modifiers here.
A discussion of ***defective*** letters in Unicode can be found here.

Every computer that deals with character-based information (and that is nearly all of them) must represent letters and punctuation in some kind of numeric form. The question is, ***what form***? When a list of available characters is arranged in numerical order, it is called a **character set**. There are two main questions to be answered when a computer company designs a character set: **Which characters** will be in the set, and **what numeric values** are assigned to them? For instance, you **could** say that the digit characters **0** to **9** would get the numeric values of 0 to 9. But what about the letter **G** or a **$** sign? What numbers do ***they*** get? The question is not so easy to answer.

Over the years, many different approaches have been devised to answer those questions. A very early system was called **BCD** (Binary Coded Decimal), which IBM enhanced to

become **BCDIC** (BCD Interchange Code) and then **EBCDIC** (Extended BCDIC), first seen on the IBM 360 mainframe systems in the 1960's. For other companies, BCD evolved into **ASCII** (American Standard Code for Information Interchange), a character encoding standard developed in the U.S. by the American National Standards Institute (ANSI), and used on many non-IBM systems. When European computer users needed additional letters, ASCII was extended by the ISO organization to become a related set of standards designated as "**8859**", with the most commonly used being **ISO-8859-1**. These are just a few of the many standards in existence. There are hundreds more of them.

Each standard may "encode" a character differently. For instance, EBCDIC defines the digit '1' as hex **F1** (base 16 notation), which is decimal **241**, while ASCII defines it as hex **31**, or decimal **49**. Older computers like CDC used octal (base 8) characters, and for them the digit '1' was octal **01**.

There are many problems with these "encoding standards", the worst of which is that there are simply too many of them. Any time two computers need to share data that conforms to different standards, the data must be converted from one standard to another. Conversion is a costly and time-consuming process. It is also error-prone, because many kinds of conversions are possible, but only one would be correct; choosing the wrong kind of conversion would result in data loss. Also, the various standards are usually not 100% compatible, because they often don't have exactly the same set of letters and punctuation, besides using different numbers to represent them. For instance, a U.S. character set might have a **$** sign but no British **£** sign, and a British character set might have the opposite situation. When equivalent characters don't exist in two different encoding standards, the data cannot be completely converted, and again, data loss would result.

A related problem is that older encoding standards do not allow for enough characters. Suppose one wanted to use two or three different alphabets in the same character set, such as English, Russian and Greek. The older standards could not allow for that. They had a maximum capacity of 256 symbols (or less), many of which were already reserved for things like English letters, digits, common punctuation and control codes like Carriage Return, and could not be reused for other purposes. Some character sets used Shift Out/Shift In codes to "escape" to a second set of symbols, and a Double Byte Character Set (DBCS) was used for Asian scripts. These techniques to extend characters sets work, up to a point, but they have many limitations, can be hard to work with, and add complexity to programs that use them.

And over time, as computers grew more powerful, they were no longer limited to upper-case English letters that could only be printed on big data-center printers. Personal computers with video screens and dot-matrix and laser printers made it possible to display and print almost anything. International commerce and the rise of the Internet placed further demands on how information was represented, and things like ASCII, ISO and EBCDIC character sets became more and more limiting and inadequate. Computer users were no longer satisfied with being able to use dozens or even hundreds of characters - they wanted to use **thousands** of characters. The old way of doing things just

wasn't working any more.

What **Unicode** provides is a single encoding standard that allows nearly all of the world's languages to be represented in one and only one way. Researching, coordinating and carefully documenting the information requirements of many countries, languages and interest groups is the task of the Unicode Consortium, and the Unicode standard has an extensive list of specifications, rules and considerations to address those needs. Some of this standard is quite complex, and is not without flaws or free of criticism. However, there is presently no better alternative, and so computer companies around the world have embraced Unicode as the best available solution.

Some of Unicode takes the old ASCII characters and just makes them larger. That is, the numbers used to represent a character in Unicode have greater numeric capacity than in ASCII. So, the character '1' in ASCII that is hex **31** is defined in Unicode as **U+0031**. This "**U+**" is the notation used to prefix a 4-digit hex number that defines a Unicode character. It has twice as many hex digits as ASCII, giving it 256 times the capacity to represent letters and symbols. "U+" notation only appears when describing Unicode characters in documentation or when discussing them between people. Internally, the computer just uses the number itself, like **0031**. The *basic* 4-digit Unicode numbers allow up to 65,536 unique symbols, and with methods to extend them, the theoretical maximum capacity is 1,114,112 distinct characters.

This Help documentation uses "U+" notation in descriptive text. When tables of many characters are listed, the "U+" is omitted. So, the letter **ẅ with Diaeresis** has a value of **U+1E85**, but in the description of the Diaeresis Dead Key, just **1E85** is shown to save space and to be easier to read. Instead of seeing **U+** appear with every letter, it just appears as a column heading.

When you are typing a document, it is usually not important or necessary to be knowledgeable of these Unicode numbers. They are presented here for purposes of clarity, so that technically-minded users can be certain of exactly what Unicode value is produced by what sequence of typed keys.

It can also be important when two different characters look the same or similar. For instance, this is **Latin letter H** and this is **Cyrillic letter H**. Can you tell the difference? **Latin H** is **U+0048** while **Cyrillic H** is **U+041D**.

By including the Unicode value in the description of every letter, you can be sure you know exactly which letter is being referred to. You can also use that information to research the technical details about a particular character. (These details can get ***very*** technical and detailed).

For instance, if you wanted information on **Cyrillic H**, you could go to http://www.unicode.org then select **The Unicode Standard → Code Charts**. Then, enter **041D** in the box labeled **Find chart by hex code** and finally click the **Go** button. You then click on the link for the "**most current code chart**". That will display a PDF document with

the Unicode block containing the character you are interested in, in this case, **041D**.

> If you cut and paste this number **041D** be sure there are no leading or trailing blanks. To be able to view the PDF file on the Unicode web site, your browser must be enabled to open a PDF file. You may need to install a PDF-reader add-on or extension to make this work. Otherwise, you would have to save the PDF somewhere and then open it outside of your browser.

The document has two main parts: a display of the letters and symbols, and a descriptive part providing additional information, cross-references and other data. You will see that the actual name of this letter is **Cyrillic Capital Letter En**. (The name is not **H**, even though it looks like it, since Cyrillic doesn't actually have a letter **H** as English speakers and other users of Latin alphabets would understand it. Many languages using Cyrillic letters do have the *sound* of an English **H** but will use another letter to represent it, which is sometimes the Cyrillic letter **X**.)

You will often see the terms "glyph" and "code point". A **glyph** is a graphic image of a letter or character. So the glyph of the letter **G** is essentially a ***picture***, consisting of a half-circle connected to two line segments. A **code point** is a ***number*** - the numeric representation of a character. For **G**, that number is hex **47** (decimal 71), conventionally displayed as **U+0047**.

For Unicode, the "representation" aspect can get complicated, because there is a difference between the code point **value** and how that value is physically **stored** as data in a file. This difference arises because there is more than one way of storing Unicode information. The methods differ in the ***order*** that data is written, and in the amount of ***data compression*** that is performed to save file space. There are standard ways of storing Unicode data, the most common of which are called **UTF-8** and **UTF-16**. The Wikipedia article noted above does a good job of explaining this. For purposes of using the Q Keyboard, you can think of "code point" and "Unicode value" as meaning the same thing.

To see how detailed this information can get, here is a web site with a detailed description of every technical attribute of just the Unicode letter **U+041D**. If you have not seen things like this before, the sheer number of facts about a single letter will surprise you (and this is only one web page):

http://graphemica.com/%D0%9D

Fortunately, you don't need all those facts. They are details used by software engineers who create things like word processors and web browsers. It's part of what goes on "behind the scenes" to make Unicode possible and allows it to do what it does.

In some cases you can confirm a Unicode value in your document. For instance, Microsoft Word allows you to type **Alt X** just to the right of some letter, and the letter will be converted into its corresponding Unicode number. That way, if you had any question, you

could be sure of exactly what you were looking at. You could then type **Alt X** a second time to convert that number back to its character form. This topic is discussed further here.

Not all software has such a feature, but this example shows the value of understanding how Unicode letters are represented.

There is **much** more to Unicode, but this introduction should be enough for you to make good use of the Q Keyboard.

About defective letters in Unicode

You will occasionally encounter what the Q Keyboard terms a "defective" letter. For instance, the letter **H** is ***defective*** with respect to the **Line Below** accent, since a precomposed letter **ẖ** with Line Below is available in lower-case, but not in upper-case.

For several *defective* letters, the Q Keyboard compensates by placing an unaccented upper-case letter on a Dead Key where an accented one would go (had one existed). This is as a convenience to you, so that if you forgot that the letter was *defective*, and (say) tried to type an upper-case **H with Line Below** anyway, you will not get "dead key junk" but will get a plain capital letter instead, which you can add a desired accent to without needing to delete the "junk" characters first. This convenience also helps out when Caps Lock is on, and you happened to type a *defective* Dead Key letter inadvertently.

In the author's view, the Unicode Consortium was short-sighted in defining *defective* letters. Perhaps the rationale was that such letters never began a word or sentence, and thus did not need upper-case forms. However, that does not take into account usage where words or phrases might be in all capitals, such as prominent titles in documents, or on signs. It also assumes that language usage will never change, which is assuming a great deal. For instance, a language group might wish to add a new letter to their alphabet, but because the one they preferred was *defective*, they would have to add accents manually to the capital form, or else pick some other, less-preferred Unicode letter that was **not** *defective*.

> This is not a hypothetical scenario. There are active languages that use capital **J with Caron**, which is a *defective* letter having no accented upper-case form.

It would be beneficial for the Unicode Consortium to amend their standard, such that all of these *defective* letters were augmented with their upper-case counterparts.

> This recommendation only applies to letters in alphabets of **actively** used languages. It is understood that most **phonetic** letters (ones **not** being used in active languages) have no upper-case equivalents. That is *normal*, and so there is no need to make upper-case counterparts for them.

About precomposed letters vs. combining modifiers

If you have experience using Unicode, the concepts of precomposed vs. combining modifiers are basic information that you are very familiar with, and you wouldn't need to review what follows. If you are new to all of this, you may need a little explanation. Mostly, the question has to do with **how** "plain" letters and accents are joined.

Consider **lower case A with Acute accent** - the letter **á**. How does this character show up on your screen or on a printed page looking that way?

The easiest way to make the character **á** appear is to use a **precomposed letter**. Recall from the discussion above that a **glyph** is a graphic image of a letter or character. When a letter is precomposed, the glyph of **á** exists as a single "picture" or "image". That image exists as a collection of numeric data values within a **font file**. Most font files you will deal with are called **True Type** fonts, and these font files usually have a file name extension of **ttf**.

> The specifics of defining a glyph image are complex, but basically a letter or symbol gets reduced to one or more **outlines** of its shape, and then those outlines are further reduced to a **list** of line segments and sections of curves, having "font metric" information like lengths, end-points, radius points of arcs, and so on.
>
> > The **number** of outlines depends on the complexity of the letter. An upper-case **I** would require **one** outline, while a lower-case **i** would require **two** outlines - one for the main letter and one for the dot above it.
>
> This representation allows a single definition of a symbol's shape to be displayed at any desired size, by applying a mathematical scaling formula to the data contained within that list. When a letter (that is, its *glyph*) is **rendered**, software within Windows converts ("interprets") the list of line and curve information and turns it into one or more regions of space on the screen or on a page, and then sets the required pixels to the letter's font color that you have selected, such as black pixels when you are displaying black letters on a white background.

When a letter is precomposed, only one Unicode **code point** is needed to define the letter. For example, the code point of **á** is **U+00E1,** for **Latin Small Letter A with Acute**. When Windows is asked to display a Unicode code point, it uses that code, like **U+00E1**, to do a "table lookup" within the font file data, and obtains the font information for that letter, which allows it to process the letter correctly.

Now, *imagine* that Unicode **didn't** define such an Acute letter **á**, but say you needed one anyway. What could you do? You would first use a "plain" letter **a** and then add an acute accent all by itself after the letter. Unicode defines many such accents, using the term "combining modifier". The plain letter on which the accent is added is called the "base letter". For instance, there is a Unicode definition for **U+0301 Combining Acute Accent**.

The base letter **a** has the code point value **U+0061** for **Latin Small Letter A**. So, if you had to "make" an accented letter, you would have two data values in your document file, which would be **U+0061** followed by **U+0301**.

So, how does Windows actually "do it"? When a Unicode value is a combining modifier, the data associated with it in the font file has certain "flags" that mark it for that special purpose. When Windows sees a Unicode character with such a flag, it knows that it has to "render" that symbol in the same visual space occupied by the immediately preceding letter. The prior letter also contains helpful information, which tells Windows that, **in case** it is followed by one of these combining modifiers, it has "hints" about *where* that accent should be positioned. That is *very* helpful, because an accent like an Acute might applied to a lower case letter ("a") **or** to an upper case letter ("A"), meaning that accent mark may have to be placed at a different height depending on the size of letter that is getting accented. That is a sophisticated process, and to be honest, not all fonts handle it well, because part of getting it right is dependent on the font designer including accurate "font metrics" information. When everything goes where it should and everything looks right, that is mark of a quality font. Windows could "guess" where accents should go, but that would add extra CPU time to figure out, and the computer's "guess" would not be as a good as a human font designer's, who had time to figure all this out beforehand. (That "helpful information" really **is** helpful.)

By the way, why does the **letter** appear first, and then the **accent** - and not the other way around? That is the simplest way to handle things when a base letter might have **more** than one accent. For instance, suppose you wanted a letter "a" with **both** an acute and a dot below. You would simply use the example above, and follow it by **U+0323 Combining Dot Below**. If you did that, the result would look like **á̤**and the data in your document file would contain **U+0061** followed by **U+0301** and finally by **U+0323**.

Assuming you are working with a good font, why not use combining modifiers all the time? There are a number of reasons why precomposed letters are better:

- A combining modifier is extra data (two code points instead of one) which takes up more space in your document file, and thus on your hard drive.

- Because there are two code points involved, if you want to delete a combined letter, you have to use a Backspace or Delete key **twice**. That makes editing of documents with these combined letters a bit more labor-intensive.

- Some types of combining accents don't work well or are not available. For instance, there are letters described in this Help as letters with "Dash Stroke", but Unicode (unfortunately) does not define a combining modifier that would make an attractive Dash Stroke. It seems like they would have, but they don't. So, while many modifiers **are** in fact available, not every type of accent that you might want to use *is*. In other cases, the modifiers **do** exist but they just aren't very good visually. You really have to test your font to see if it will look right if you try doing this in your documents.

- The process of combining an accent with a base letter takes extra CPU time. While computers are fast and this happens quickly, it's not instantaneous. The more of these added accents you use, the longer it will take a text editor or word processor to scroll through a document, and the longer to insert and delete letters. If you have a very long document with many such characters, and you are running on a computer with only modest processing power, you may see a noticeable slowdown.

- When a combining accent is added, Windows has to determine where to place it, and it has to do it as fast as possible to avoid such slowdowns. Because of that, it's "placement logic" does the best it can, as fast as it can. But the fact is, the human eye and human judgment are much better determiners of such things than a computer is. Much of font design requires "artistic finesse" that is hard to quantify for a computer. When a human font designer "hand tailors" accents on letters, the results are almost always superior to any computerized font rendering logic.

Having said that, font designers and computerized "font rendering engines" are getting better all the time, and the drawbacks of using combining accents are not as much a problem as they might have been in the past.

Finally, there are letters you may need for a language that simply don't exist as predefined letters, and then you have no choice but to use combining modifiers. For instance, some languages have an N with Diaeresis, which doesn't exist in Unicode. To make **n̈ N̈** you must use a plain **n N** and add the accent.

You might wonder, why doesn't the Unicode Consortium just add every possible accent to every possible letter and be done with it? The main reason is if they did that, it would vastly increase the number of defined letters. Many of such letters might rarely if ever get used. It appears the deciding factor is how many people and languages might use an accented letter. If the number is large, they will probably make it precomposed (or, probably already have). For an accented letter used by few people and few languages, they are reluctant to make a precomposed one, when a combining accent could be used.

> That answer from the Unicode Consortium doesn't always satisfy everyone, because oftentimes a combining accent doesn't render well and the resulting appearance is poor. It is for this reason that interest groups petition the Unicode Consortium to add letters they feel will benefit them. The Unicode standard is, without doubt, a work in progress, and changes like this are requested all the time. Some will get approved, and some won't.

One last point. The "base" letter you choose to accent might **already** have an accent on it. Suppose you wanted a letter **a** plus an **Acute** plus a **Dot Below**. It's not necessary to do it "the hard way" by adding both accents individually to a plain "a". In almost all cases, it's actually better if you **didn't**, if you have a choice.

There are some African languages, as well as indigenous ones, that require such specialized, dual-accent letters. Whenever possible, always start with a letter having one

of the desired accents, then add the other one. Because there may be two different ways this could be done, you may wish to experiment to see which way works best. For instance, there are precomposed forms of both **á** and **ạ** so you would have to pick one of them, then add the remaining accent as needed. One way might look better than another.

Windows ENG language icon

It is expected that many users will frequently swap between the Q Keyboard and a standard U.S. QWERTY layout. The easiest way to do this in Windows 10 is by holding the Windows Logo key and tapping the Spacebar. If you do this, the first time you press Spacebar the input method will change, but the keyboard-selection popup display for it will **not appear**. If you press Logo+Spacebar again, the display will stay visible until you let go of the keys, so you can see what you are doing. This is not as important if you only had two choices, but if you had several input methods in your list, it could get confusing if you couldn't see that display; you might be unsure as to what input method you just selected.

> See Where is my Windows Logo key? for more information on how this key is supported on the Q Keyboard.

If you are not on Windows 10 or prefer not to use the Logo+Spacebar key sequence, you would need to click on the **ENG** language icon and then select the desired keyboard. That method is available as of Windows 8. Earlier versions of Windows had other methods, which are not discussed here.

Since the Q Keyboard is based on the U.S. QWERTY layout and it requires a standard U.S. QWERTY keyboard, it is likely most users will only have **ENG** as the language shown. If you also use another keyboard like AZERTY, this acronym will vary between **ENG** and **FRA**, for instance.

Windows treats the Q keyboard as an additional Input Method. When you have more than one input method available, Windows should automatically make the ENG language icon visible on the taskbar. In the course of installing the Q Keyboard software, this icon should appear without requiring you to take any additional action. If for some reason the icon is not showing up, you can manually enable it by using a Windows setting option.

In Windows 10, the easiest way to do this is to go to the Search Windows feature on the taskbar (click on the magnifying-glass icon), and start typing `system icons`. You should see an application appear called **Turn system icons on or off**. Click on that. In the **settings** display that appears, about five lines down, you should see an entry for **Input indicator**, and a slide switch to the right of it. **Slide the switch** as needed. The **ENG** icon will appear or disappear immediately as you move the slide switch left or right.

The current state of Windows regarding its various language options is inconsistent. There is more than one way to manage the language icon, such as starting from the Control Panel. Procedures required on Windows prior to version 10 are not consistent either. If you need to enable this icon and the method described above doesn't work or apply to you, the best advice would be to review available Microsoft documentation or do an Internet search. Many Internet articles focus on **removing** the **ENG** icon rather than enabling it. You can still use those articles, because they will direct you to the required area of Windows that has the setting, and then you would alter it as needed.

Windows keyboard preview

When you select or review an available keyboard layout (also known as an Input Method) a feature in Windows allows you to "preview" a layout, in addition to adding new ones or removing old ones. **Previewing** a keyboard means to display a graphic representation of the layout so you can see what keys are available and where they are located.

In Windows 10, you can find the screen for selecting an input method like this:

Control Panel → Clock, Language and Region → Language → Language options

If you start from the Windows task bar and click on the language acronym like ENG, getting to the input method is done like this, using ENG as an example:

ENG → Language preferences → (in Settings, Region & Language) →
Additional date, time & regional settings →
(under Language) Change input methods

Refer to Windows ENG language icon for information on how to enable display of **ENG**.

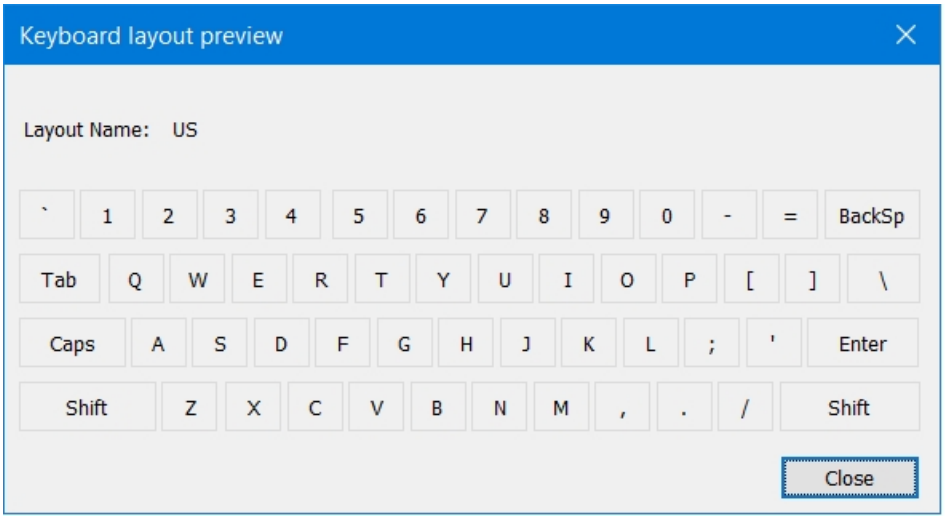
You could Add a language here, but internally the Q Keyboard's language is always English, even though it's an international keyboard, because it uses the U.S. QWERTY as a starting point. Instead, within the rectangle that shows "English (United States)" click on Options. That will bring you to the same Language options screen noted above.

By the way, when you "remove" an input method, it just takes it off the list of available choices that are presented when you want to change between layouts. "Removing" the layout does not actually delete anything. You can always add the layout back again, as long as you don't delete the underlying keyboard DLL file in the Windows\System32 directory, which is not normally done. Incidentally, if you remove any entries from the input method list, be sure that ***at least one usable keyboard is still in the list*** before you save it, or you might not be doing much typing from that point on.

When you look at a system-defined keyboard such as the standard U.S. QWERTY in the Windows Input Method screen, you can click on a Preview link to the right of the name. The link will look like this:

Preview | Remove

If you click on Preview, you will see a picture of the layout in question. This is what the display of the U.S. QWERTY looks like in Windows 10:



When you see an entry for one of the versions of the Q Keyboard that have been installed on your system, you will ***not*** be able to Preview it. Instead, the link will look like this, where **Preview** cannot be clicked:

Preview | Remove

There is no need to be concerned about this; it's normal and expected. In a system-provided keyboard layout, the names of all keys are stored in a list of data values inside the keyboard layout file, which takes up a certain amount of space. These values are called a "key name list". The Q Keyboard pushes the capabilities of keyboards to their very limit. To do that, the "key name list" is omitted to utilize the space for more important purposes, but without that "key name list" available, Windows cannot display a Preview graphic.

As you can see from the image above, these Preview displays are not very informative. You are not missing anything important by being unable to Preview a Q Keyboard. Since the Q Keyboard is based on a U.S. QWERTY, its implied Preview display would be the same as the one that appears above, so it would not provide any additional information.

Everything you need to know about the Q Keyboard is already in this Help documentation.

Windows 10 update issue

Windows 10 users may encounter a problem when an automatic update to Windows is applied to your computer.

The Q Keyboard software that is installed on your system gets placed in the Windows System32 directory. Because this directory is critical to the operation of Windows, Microsoft has chosen to "err on the side of caution". When it finds a keyboard device driver during the update process that it determines has "come from the outside" it will unregister that driver, to protect your system in case that software were actually a virus or malware. Even though the Q Keyboard software will technically still be "present", it becomes unusable because Windows itself no longer "sees" it as an active keyboard layout.

If you run the Q Keyboard software on Windows 10, and it stops functioning after a Windows update, rerun the install application to restore it. You may need to restart Windows afterwards for this change to become effective. You may also need to reestablish the Windows ENG language icon.

> If the install program responds by saying it is going to **uninstall** the software, allow it to proceed, and then run the install program a second time. The Q Keyboard software should be fully restored. The install process runs very quickly, taking just a few seconds to complete.

Because this restore technique requires rerunning the install application, it is important that you keep a backup copy of it, including a copy on external media, so it will be available when needed.

Keyboard compatibility

When you operate the Q Keyboard in software-defined mode, any keyboard compatible with the U.S. QWERTY should be suitable for use. This includes wired and wireless keyboards, external USB keyboards, and integrated keyboards on laptop computers.

There are not many modern computers that still support the PS/2 keyboard interface, and even fewer that support keyboards with AT or DB9 connectors.

Be advised that if you connect an older keyboard to your computer using a converter cable, it may not function correctly. For instance, if you have a PS/2 external keyboard, and you use a PS/2 to USB converter cable to connect to your computer, it must change the PS/2 signals to ones compatible with the USB keyboard standard. The digital logic chip inside such converters may not be compatible with the Q Keyboard's special use of "chords" and its **AA**, **BB** and **CC** modifiers, especially if the converter itself is also older. Because of this, some key sequences used by the Q Keyboard that work fine on other devices may fail when connecting your keyboard with a converter.

If you encounter this issue, the only solution is to obtain a more modern keyboard that does not require a converter cable. This will almost certainly mean a USB-based keyboard, or one that is wireless.

Note 1: Testing of the Q Keyboard using a PS/2 based keyboard device on a Windows 10 system with a native PS/2 connector (not using a converter cable) encountered no difficulties. So, this issue does not appear to be caused from PS/2 itself, but from the converter cable.

Note 2: At the time keyboards with AT or DB9 connectors were common, the current PC 104 layout did not exist. Keyboards with the AT connector most likely had a PC 101 layout. You cannot use a PC 101 layout, because it does not have a Windows Logo key that could be mapped to the Q Keyboard's **BB** modifier.

Software compatibility

Because the Q Keyboard is implemented as a standard Windows device driver, all software that is conformant to Windows Win32 design guidelines should operate correctly. For instance, any character that is defined on the keyboard should be available to type when you use Microsoft Word. Of course, you will only be able to see characters present in the font you are using; otherwise an empty-square symbol would appear.

A problem can arise when certain software attempts to access the keyboard at a low level, bypassing the conventional keyboard processing logic and system protocols built into Windows. Depending on the extent to which such software "breaks the rules", some aspects of the Q Keyboard may not work correctly. You might encounter some Dead Key letters that do not appear as expected when typed, or other issues may occur.

A possible work-around for such conditions is to type your desired characters into a text editor that does not break the rules (such as Windows Notepad), then copy that text from the text editor to the Windows clipboard, and from there, paste it into the application that is causing the difficulties.

> A Unicode-compliant shareware text editor that should work well is **NotePad++**.
> For more information on this editor, see https://notepad-plus-plus.org/.
>
> Another helpful Unicode editor is **BabelPad**.
> For more information on this editor, see
> http://www.babelstone.co.uk/Software/BabelPad.html.
> Software is periodically updated, so be sure to check if you have the most current version.

Users experiencing such issues are invited to report them to info@qKeyboard.com, so they can be investigated. You can also report issues on the Q Keyboard online forum located at http://qKeyboard.proboards.com.

Text highlighting issue

Testing has shown that certain text editors will **delete highlighted text** when you press the **AA**, **BB** or **CC** modifier keys, or any combination of them, with or without Shift. In theory, holding down any of the Q Keyboard's special modifier keys should not be any different than holding down a Shift key. In practice, an editor having this issue will remove the highlighted text, as if the Delete key were pressed once. You will have to test your software to see if this is an issue in your environment. Microsoft Word and Notepad++ did not exhibit this problem, so it does not seem to be caused by a flaw in the Q Keyboard software.

If you are using an editor and highlight some text, and then press a Q Keyboard modifier

key, the most likely reason you did that is because you wanted to replace the highlighted text with some non-English letters or special characters. So, this unexpected deletion should not be a big problem, except that is will be a surprise when you first see it happen. If this is a concern, you can highlight your text and intentionally delete it with the Delete key, then proceed to enter your special characters. If possible, you might be able to use another editing tool that does not have this behavior.

The biggest problem this issue might cause is if you accidentally pressed **AA**, **BB** or **CC** and deleted text when you didn't mean to, when you had highlighted your text for some other reason, like changing its case. If this happens, your only recourse would be to use an **Undo** feature, if one is available. Most software uses **Ctrl Z** to undo a change. When you do this, remember to use the Ctrl key that is ***not*** assigned as the Q Keyboard **CC** modifier.

Windows 10 keyboard swapping issue

Testing has shown that if you use the Windows 10 feature of **Windows Logo + Spacebar** to swap the active keyboard layout, sometimes Windows may then process the current keyboard improperly if the "swap" took place inside of an application. **This appears to be a Windows bug that exhibits itself only intermittently, and not in all applications**.

When a "swap" is performed while the main desktop window is in view, this problem does not seem to occur. If you encounter this, you may be able to force Windows to reset the current keyboard by pressing **Windows Logo + Spacebar** a few times while the main desktop window is in view. If that does not work, you may need to close the application experiencing the problem, press Windows Logo + Spacebar a few times, then restart your application. If you frequently run applications that have this issue, you will have to remember to enable the Q Keyboard **before** opening your application, or else configure Windows to start up with the Q Keyboard already enabled as the default keyboard layout and input method.

Internet browser compatibility

If you are operating the Q Keyboard while using an Internet browser, some key sequences may not operate properly. That is not the fault of the Q Keyboard, but is caused by the browser failing to recognize the key sequences (or the "foreign" letters) you may be using as "valid". Microsoft Internet Explorer is known to have this problem, and it has been an issue for them before the advent of the Q Keyboard. Other browsers may also have this shortcoming. For some reason, browsers that appear to work correctly most of the time seem to fail when you begin a "chat session" of some kind, such as Twitter (and Twitter private messaging or "DM") as well as online "help" dialogs offered by many companies such as online merchant sites.

Two browsers that appear to work well with the Q Keyboard are Chrome and Opera. Another browser you can try is Firefox. However, recent versions of Firefox have exhibited

high overhead when used to access the web site Twitter. You will have to experiment to find the software that works best for you. After considerable research, the author found that Opera works well for online access using the Q Keyboard. Since Internet software of all sorts is often upgraded frequently, circumstances can change, so you need to confirm whether this is currently an issue in your environment.

Update: Firefox released a new version, 61.0.1 in the summer of 2018. This release has improved performance over versions of a few years ago, and appears to successfully operate with the Q Keyboard. You may wish to try this.

DirectX compatibility

Some older software packages such as video games may make use of a **Microsoft DirectX** feature called **DirectInput**, which is a way for a program to obtain low-level access to a keyboard in a way that bypasses much of Windows. Microsoft considers this as a deprecated technology and discourages its use. If you use such software, the extra features of the Q Keyboard will not be recognized. Your software should not "fail" but you would not be able to enter the many international letters defined in the Q Keyboard, because DirectInput bypasses the keyboard device driver, and your keyboard would simply appear as an ordinary U.S. QWERTY. Newer software that is written in compliance with current Microsoft developer standards and recommendations should have no problem working with the Q Keyboard.

WGL4 and MES support

The **Windows Glyph List 4**, known by the acronym **WGL4**, is a preferred list of **656** characters selected by Microsoft, used to specify a common set of glyphs to be supported by approved fonts.

A description of this list and the repertoire of included characters may be found here: https://en.wikipedia.org/wiki/Windows_Glyph_List_4

A discussion of the characters at **U+F001** and **U+F002** may be found here: https://en.wikipedia.org/wiki/Private_Use_Areas

The Q Keyboard supports all but **33** characters in the **WGL4** list.

The omitted symbols, shown below, are in these categories:

- Box drawing characters that are "transitions" from single-line to double-line form
- Block drawing characters
- Miscellaneous symbols ('dingbats') from the MS-DOS 435 code page
- Two symbols used internally by Microsoft as duplicates for the **ff** and **fl** ligatures

These characters absent from the Q Keyboard are present in **WGL4** mainly for backward compatibility with 8-bit MS-DOS applications, and were often used to create boxes and forms for "green-screen" video displays and for printers using monospaced fonts. In nearly all cases, these things would have been created with software, rather than being typed manually. There is little need for them now, since Windows has superseded that functionality and does a better job of it. For those wanting 'dingbat' symbols, these have tremendously grown in number since the days of MS-DOS.

> As discussed in the article on Box drawing symbols, the Q Keyboard does support line box drawing characters having **one** type of line (single or double) but not those with 'transitions' between these two types.

The characters below have been omitted due to lack of demand, and in the case of the box drawing symbols, because of difficulty in determining suitable keyboard locations to assign them to. If you did have a need to type one of them, you could use a Character Map or Insert Symbol technique, or an application like BabelMap to access these characters.

The main point is that all the remaining **WGL4** characters are available, so if you are typing a **language** dependent on letters from the **WGL4** character set, the Q Keyboard has you covered.

A note about Multilingual European Subsets

A set of European standards comparable to **WGL4** are known as the **Multilingual European Subsets**, or **MES**. Two versions of this standard are considered here, those being MES-1 and MES-2. MES-1 and MES-2 are a superset of WGL-4, and have a total of 1064 characters.

> Information about **MES** can be found at https://en.wikipedia.org/wiki/Unicode. Scroll down to find paragraph **2.4** in the table of contents, **Standardized subsets**.

The Q Keyboard has nearly all symbols in MES-1 and MES-2. The characters omitted are the same ones missing from WGL4 shown below, as well as extended letters used in the Greek Polytonic Orthography, and a few Greek-specific punctuation symbols.

As noted in Greek letters, it was not the intent of the Q Keyboard design to include polytonic accents or to fully enable use of the keyboard by native Greek speakers, but to provide a facility to occasionally enter Greek letters as symbols in math formulas or for use in languages that have a few Greek letters in mostly-Latin alphabets.

Sym	U+	WGL4 symbol not present on the Q Keyboard
╒	2552	BOX DRAWINGS DOWN SINGLE AND RIGHT DOUBLE
╓	2553	BOX DRAWINGS DOWN DOUBLE AND RIGHT SINGLE
╕	2555	BOX DRAWINGS DOWN SINGLE AND LEFT DOUBLE
╖	2556	BOX DRAWINGS DOWN DOUBLE AND LEFT SINGLE
╘	2558	BOX DRAWINGS UP SINGLE AND RIGHT DOUBLE
╙	2559	BOX DRAWINGS UP DOUBLE AND RIGHT SINGLE
╛	255B	BOX DRAWINGS UP SINGLE AND LEFT DOUBLE
╜	255C	BOX DRAWINGS UP DOUBLE AND LEFT SINGLE
╞	255E	BOX DRAWINGS VERTICAL SINGLE AND RIGHT DOUBLE
╟	255F	BOX DRAWINGS VERTICAL DOUBLE AND RIGHT SINGLE
╡	2561	BOX DRAWINGS VERTICAL SINGLE AND LEFT DOUBLE
╢	2562	BOX DRAWINGS VERTICAL DOUBLE AND LEFT SINGLE
╤	2564	BOX DRAWINGS DOWN SINGLE AND HORIZONTAL DOUBLE
╥	2565	BOX DRAWINGS DOWN DOUBLE AND HORIZONTAL SINGLE
╧	2567	BOX DRAWINGS UP SINGLE AND HORIZONTAL DOUBLE
╨	2568	BOX DRAWINGS UP DOUBLE AND HORIZONTAL SINGLE
╪	256A	BOX DRAWINGS VERTICAL SINGLE AND HORIZONTAL DOUBLE
╫	256B	BOX DRAWINGS VERTICAL DOUBLE AND HORIZONTAL SINGLE

▀	2580	UPPER HALF BLOCK
▄	2584	LOWER HALF BLOCK
▉	2588	FULL BLOCK
▌	258C	LEFT HALF BLOCK
▐	2590	RIGHT HALF BLOCK
▒	2591	LIGHT SHADE
▒	2592	MEDIUM SHADE
▓	2593	DARK SHADE
◘	25D8	INVERSE BULLET
◙	25D9	INVERSE WHITE CIRCLE
☺	263A	WHITE SMILING FACE
☻	263B	BLACK SMILING FACE
☼	263C	WHITE SUN WITH RAYS
	F001	DUPLICATE OF FB01 LATIN SMALL LIGATURE FI
	F002	DUPLICATE OF FB02 LATIN SMALL LIGATURE FL

Undefined keys

As you review the Q Keyboard documentation, you will see that some key locations are unused. For instance, there is no such letter as **M with Diaeresis**. If you try to type this, you will get **ẍm** or something similar. The documentation refers to this as Dead Key Junk. This is normal, and does not indicate an error in the keyboard. It just means you used an undefined key sequence.

> This behavior is properly termed ***Dead*** key junk, because unassigned **Live Keys** do not produce junk. Depending on the given release of the Q Keyboard software, a small number of Live Keys might be left unassigned. If there were any, and you typed an unassigned Live Key, nothing would happen. (Currently, all possible Live Keys are assigned.)
>
> If you really wanted an **M with Diaeresis**, type a plain **m**, then hold **AA** and type the colon/semicolon key **twice** to get the **m̈** letter you need. See Combining Diacritics for more information.

You may also find certain keys **are** defined, even though the documentation does not show them as such. In some cases, "Literal" locations shown as undefined may produce "Representative Characters" when typed, even though that is undocumented. This is a consequence of the architecture and tools used to create the Q Keyboard, and is nothing important to be concerned about.

> Additionally, the Capitalization rules of the keyboard *imply* many key combinations that are not explicitly documented, since they all follow a common pattern. This is not quite the same as being "undefined", but their presence might surprise you until you get used to the keyboard's design.

You are free to use any undocumented key locations, if they happen to produce characters you are interested in. Be advised that no guarantee is made that the behavior of undocumented key locations will be retained in future versions of the Q Keyboard software. All useful characters are fully discussed. There are no undocumented keys with anything you need that cannot be obtained from an officially documented key.

Punctuation

In this document, there are numerous references to key sequences, with instructions on how to type them and in what order. These key sequences often contain many special characters.

A problem arises when these instructions are part of a sentence. For instance, here is a sample instruction:

> Tilde **ñ Ñ** is on **CC N.** C with Cedilla **ç Ç** is on **BB C.**

This is "proper punctuation" that would pass a grade-school grammar test. The problem is, it's confusing. Are the ending periods ***also*** part of what is typed? No, but the objective is to be as clear and precise as possible, not to confuse people. It could be confusing if a key sequence actually **did** end with a period, and some of them ***do***.

To avoid this problem, whenever a key sequence appears as the end of a sentence, it will not be ended by a period, but by a • **bullet symbol** instead. Further, when a sentence stands alone with a key sequence at the end of it, it simply ends with that, and both the bullet and period are **omitted**. The style used in our documentation actually appears as:

> Tilde **ñ Ñ** is on **CC N** • C with Cedilla **ç Ç** is on **BB C**

This tells you that the • bullet is **not literally typed**, but simply ends the first sentence. (You can produce a bullet with a key sequence, but there is no bullet **key** on your keyboard.)

> As an example of a key sequence ending in a period, the **ʔ** symbol **U+0294 LATIN LETTER GLOTTAL STOP** is on **AL 9 .** • Here, the bullet is included because the sequence actually ends in period, and not using bullet here would be even **more** confusing.

Using the bullet symbol may be overly careful, and is not always strictly necessary. When the context is clear enough that a period would not be misunderstood, the bullet notation may be skipped. However, having clear, unambiguous documentation is important and so it takes precedence if there is any question.

Naming the keyboard

The formal name of this keyboard design is "The Q International QWERTY Keyboard".

The documentation generally refers to this as "The Q Keyboard" for short.

This name has been the working title of the Q Keyboard project during its development phase. In time, should the Q Keyboard become commercialized or sponsored by a hardware vendor, it is likely that this name may get changed, for reasons of advertising, promotion, branding, protection of intellectual property rights, and possible trademark issues. The names "Q Keyboard" and "The Q International QWERTY Keyboard" are not currently registered or cleared for trademark usage.

Regardless of the eventual name this keyboard is formally known as, it is the author's wish that users would informally refer to it as "Robert's Keyboard".

Notes:

> Croatian linguist Ljudevit Gaj created the alphabet used for Serbo-Croatian in 1835. It worked so well that it is now used for Serbian, Croatian, Bosnian and Montenegrin, and variations of it are used in other languages. Rather than being called the "Croatian Alphabet" or the "Serbian Alphabet", it is widely known as "Gaj's Alphabet", out of regard for this accomplishment of Mr. Gaj. In like manner, should the Q Keyboard become as beneficial to its users as Gaj's Alphabet proved to be, it is the author's wish that the end result of this project be known and remembered, if only informally, as "Robert's Keyboard".
>
> Initially, this project was called "The International QWERTY Keyboard", or "IQ Keyboard". However, a search revealed that another company had a web site named "IQ Keyboard", even though they didn't actually have a product with that name. So, the name of this project had to be changed. (That was regrettable. "IQ Keyboard" had a nice ring to it, and it was hard to let it go.)

The writing style

As you read through the Q Keyboard reference manual, you may or may not prefer the author's writing style. In attempting to explain things clearly, at times the manual may over-explain matters when doing so is not strictly necessary.

The author is, by experience, a software engineer first and a writer second. The reader's patience is asked for any literary shortcomings.

But more importantly, this (perhaps too) careful style was intentional. People who use keyboards come from all walks of life, and for this particular keyboard, potentially from all parts of the world, with wide variations in education and technical knowledge. In order to be of the most benefit to the most people, a conscious effort was made to not assume too much prior knowledge about all the details of languages, alphabets, fonts, the Unicode Consortium, and the other technicalities that this project touches upon.

The hope is that even persons of modest educational and technical experience, such as younger typists, could learn from this document and be productive, while those with a more extensive background could quickly read though or skim the material, even if its over-explaining style tests their patience a little.

One other aspect you may also notice is that the fonts in this documentation are slightly larger than typically used in a technical manual. This was intended to make the Help accessible for all users, including those with vision limitations. The Dead Key Guide in particular uses a large, easy-to-read font for that reason, and to help clarify distinctive accents and other features of characters that might otherwise be hard to distinguish.

> This document has been formatted to be the most readable when viewed with 125% zoom using CHM and PDF readers. The font sizes and other formatting choices were made with this in mind.

In writing a lengthy document that may be seen by persons of many different countries, languages and cultures, it is possible for innocent remarks to be inadvertently taken as culturally insensitive by some readers. Great care was taken in trying to avoid such a thing, but should you have concerns about anything written in this document, you are invited to forward your comments to the author for review.

Note:

In descriptions of key sequences, you will notice that references are often made to "the Shift key", as if there was only one of them. Because both Shift keys work the same as in a standard QWERTY keyboard, it is understood that "the" Shift key is whichever Shift key you happen to be using at the time.

Just to be clear, the Q Keyboard does **not** alter the behavior of the Shift keys (though

technology exists to do such things). It is just simpler to use this (somewhat inaccurate) language than trying to be overly precise and say something like "release the Shift key you initially pressed".

Part 1: Frequently Asked Questions

To help new users understand the Q Keyboard as quickly as possible, this section tries to provide answers to questions you are most likely to ask about its design.

> As the Q Keyboard user community grows, your own questions are welcomed, and perhaps will be added to this section.

To help each of these articles stand alone as much as possible, portions of one FAQ article may slightly overlap or repeat some of the information in other articles, such as when discussing details of the Q Keyboard modifiers.

What is the Q Keyboard?

The Q Keyboard is a keyboard device driver, operating on Windows. Its purpose is to make available the letters required to write many Latin-based languages, and also a large array of additional characters.

> For those unfamiliar with the term, a *device driver* is a piece of software - a small program - that assists Windows to interact or *interface* with a device, whether that be a keyboard, a mouse, a hard drive or other "extra" parts of your computer, when those devices might vary in features and functions from one computer system to the next.

The Q Keyboard defines an architecture which may be implemented either as a *software-defined keyboard* operating on a standard U.S. QWERTY keyboard, or as a hardware-defined keyboard. Both require a Q Keyboard device driver, with slightly different characteristics for each. The main distinction is that a hardware-defined keyboard does not take away (repurpose) any standard QWERTY keys for its operation, but instead has unique **physical** modifier keys known as **AA**, **BB** and **CC**. Otherwise, the functionality and character repertoire of the two types of keyboards are the same.

All keyboards transmit "Scan Codes" to the host computer, to identify which physical key has been pressed. These Scan Codes (simply small, encoded numbers) are interpreted by the currently active keyboard device driver, such as the one provided by the Q Keyboard. For instance, the Scan Code of the **A key** is **hex 1E**. Scan Codes are independent of letters. In this example, the Unicode value of capital **A** is **U+0041** and lower case **a** is **U+0061**, neither of which matches the Scan Code. The device driver translates scan codes into Unicode characters, taking into account other keys (such as Shift) that may also be held at the same time, and then passes them along to the host operating system.

> Keyboards produce Scan Codes rather than Unicode because key combinations (like Shift, Ctrl or Alt plus a letter) must be interpreted, based on how the keys are used and combined when you type them. That interpretation varies from one language to another, and is the job of the device driver. Also, the keyboard Scan Code protocols were designed years before the use of Unicode became widespread.
>
> The interpretation process in the Q Keyboard is more complex, since it has three more keys (**AA**, **BB** and **CC**) to consider than a regular keyboard, and these keys can be used not only alone but with Shift and at times with each other.
>
> By using Scan Codes, the same basic keyboard device can be manufactured for many different languages and countries with the same hardware, with only the printed keycap legends being different. It is the device driver software that makes each keyboard unique and associates the Scan Codes with the particular letters for each language supported. For more information on Scan Codes, this article in Wikipedia is quite informative.

Why are these numbers called ***Scan*** Codes, and not just "codes" or "key codes"? It is because most keyboard circuitry is arranged in a grid of rows and columns, where each key electrically 'exists' at the intersection of a row and column. To determine if a particular key has been pressed, circuitry will select successive rows and columns, looking for a key-down condition. Though that sounds complicated, it is less expensive to make than trying to connect every key individually to a complicated keyboard controller. The scanning circuits operate very fast, so there is no noticeable time lag in detecting keys. The process of looking for a pressed key, one at a time, from beginning to end of the rows and columns in the grid, is a "scanning" operation. The row number and column number of the grid become the basis of the scan code number. Modern keyboards are more complex than this, and the encoding of scan codes is not quite as simple as that, but this basic idea still forms the basis of nearly all keyboards. One factor that complicates this concept is that simple keyboard scanning can be 'fooled' when multiple keys are held down. Keyboard companies attempt to resolve that problem by "N-Key Rollover" circuitry. See this article for more information about N-Key Rollover.

It is possible to use the Q Keyboard in legacy applications that expect an 8-bit character set, such as Windows code page 1252 (which is often referred to as ANSI). Windows will automatically convert any compatible Unicode letters to the active 8-bit code page in effect when running such applications. That could be ANSI, or any other code page available on Windows.

If the letters and symbols you need are limited to one of those code pages, you can certainly use the Q Keyboard to type them. If you type something that is outside the currently active code page, Windows or your application may display a substitute symbol, a question mark, some random "junk" data, or possibly nothing. The substitute symbol could be an unaccented version of the letter you typed. For instance, you might type **ğ with Breve** and see a plain **g** instead.

Many international users will require characters that do not fit into 8 bits and cannot be accommodated by an 8-bit code page. To access these extended characters, and gain the most benefit from the Q Keyboard, it needs to be operated in conjunction with Unicode-enabled host application software, such as Microsoft Word.

What references were used?

Creating the Q Keyboard would not have been possible without the help of a number of reference works on languages and alphabets. The main sources consulted were as follows:

Simon Ager and the **Omniglot** web site. This provides alphabets and other information on hundreds of languages, and has a wealth of additional information.
http://www.omniglot.com/

Wikipedia has numerous articles on languages and alphabets of all sorts. Additionally, a large number of individuals (too many to mention) have published their own research on the topics of keyboards, fonts, alphabets and languages.

SIL International (once known as Summer Institute of Linguistics). SIL provides many language resources, and has a number of its own fonts, most notably Gentium Plus.
https://www.sil.org/

ScriptSource. This site has the following description: "ScriptSource is a dynamic, collaborative reference to the writing systems of the world, with detailed information on scripts, characters, languages - and the remaining needs for supporting them in the computing realm. It is sponsored, developed and maintained by SIL International." ScriptSource has ambitions of being a database of all languages, alphabets and letters, but many of its entries are empty shells, with the information remaining to be filled in by voluntary contributors. When entries are found that have been populated, the information is useful and informative.
http://scriptsource.org/

Michael Everson and the **Evertype** web site. Mr. Everson is a language expert who has contributed to the Unicode standard. Besides providing general language articles, **Evertype** publishes Everson Mono fonts and an orthographic review called "The Alphabets of Europe".
http://www.evertype.com/
http://www.evertype.com/emono/index.html
http://www.evertype.com/alphabets/

In addition to these references, a number of existing keyboard designs have been carefully studied, to determine language requirements, design strategies and best practices. In particular, the author notes the German **T2** keyboard as a remarkable design. While not as extensive as the Q Keyboard is, the T2 is a comprehensive international keyboard, both well-suited to typing German and to supporting several popular languages. The T2 does many things well, and its designers are to be commended.

Another very capable layout is the Finnish Multilingual keyboard, also known as the Finnish keyboard standard **SFS 5966**. No keyboard does everything (not even the

Q Keyboard), but if you needed a standard, commonly available layout that handled as many Latin languages as possible (though not always the easiest to type) it would be hard to do better than the Finnish design. Note that while the design of this keyboard is a good one, it is hampered by poor availability of keyboard device drivers.

Q Keyboard statistics

The table below provides statistics on the most recent analysis of the Q Keyboard.

The letters, punctuation and special characters available on the Q Keyboard are periodically revised in response to user feedback or changes in design.

The statistics appearing below are manually compiled from machine-readable resources. While these numbers are believed to be an accurate depiction of the keyboard, they are subject to review and correction.

Q Keyboard Statistics as of 2019-02-23 Revision 19.054		
		Live Keys (Spacebar is key 612, not counted here)
	611	Total QWERTY keys using all possible modifier combinations
–	77	Digraphs (count also includes Trigraphs)
–	48	Diacritic (Dead Key) Introducer Keys (via AA and AA+Shift)
=	486	Non-Digraph, Non-Diacritic Live Keys
–	5	Redundant Live Keys
=	481	Non-Redundant, Non-Digraph, Non-Diacritic Live Keys
–	291	Redundancies between Live Keys and Dead Keys (see below)
=	190	Unique Live Keys not also represented as Dead Keys
		Dead Keys (count also includes Held Keys)
	3259	Defined Dead Keys
–	974	Redundant Dead Keys, including Early Shift Redundancies
=	2285	Non-Redundant Dead Keys
		Combined Keys
	2766	Non-Redundant Live Keys (481) and Dead Keys (2285)
–	291	Redundancies between Live Keys and Dead Keys
=	2475	Non-Redundant Combined Keys
+	77	Digraphs
=	2552	Produceable Symbols

Language statistics

The table below is a summary of statistics on the languages supported by the Q Keyboard. For a detailed list, refer to Part 9: List of supported languages.

The Q Keyboard relies on available research and reference materials to determine what letters and symbols to include.

The most comprehensive reference work is the **Omniglot** web site. Among other things, it contain a list of languages using the Latin alphabet.

See http://www.omniglot.com/writing/langalph.htm#latin for more information. You may need to scroll down to the heading "**Writing systems used to write more than one language**" and then click on **Latin**.

The Omniglot web site is periodically updated and corrected. The table that appears below reflects representative information that was current as of 2017-01-10.

As may be seen, 134 languages only used the letters A-Z of English and do not require the facilities of the Q Keyboard. There were 15 entries that could not be used for various reasons.

For the remaining 455 languages that use accents, the Q Keyboard is capable of typing all of them.

> As part of the Q Keyboard's language validation process, some 750 alphabet spreadsheet files were downloaded for Latin languages described on Omniglot, some time after the statistics shown below were compiled. The Unicode text of these files was extracted and a composite character usage list created. A comparison of this list to what the Q Keyboard supports (as seen in the Appendix) shows that every letter of every Latin language currently listed in Omniglot (as of March 1, 2018) is fully supported on the keyboard. Not all of these languages used accents, and there may be a small amount of duplication or overlap in the samples that were inspected. Still, these results should instill confidence in the capabilities of the Q Keyboard.
>
> The Germanic language **Hunsrik** has two accepted orthographies, both of which the Q Keyboard is capable of typing. There is a proposed third writing system intended to phonetically represent Hunsrik, which is not in general use. At present, this third system is not fully supported. See the discussion here for more information.

Note that for languages needing Dead Key letters to complete their alphabets, many require only one or two, with the remainder available as Live Keys. For those that required more than two Dead Keys, most needed five or fewer.

So far, no documented languages that were truly "Latin" have been found that the

Q Keyboard was unable to type. However, as the Omniglot web site itself notes with respect to its own coverage of languages, "This is not an exhaustive list of all the languages written with each writing system, but mainly the ones that appear on Omniglot." Omniglot notably makes no claim of enumerating every Latin language in existence. Thus, there are additional Latin-based languages in current use that are not mentioned here, some of which may be covered by the Q Keyboard and some that possibly are not. The author of Omniglot has periodically added entries for new languages to its web site since the initial creation of the Q Keyboard Help document. That web site and the new entries that are periodically added are reviewed on a regular basis, and to the knowledge of the author, no new Latin language entries have been published that contain letters unavailable in the Q Keyboard. Of course, that situation could change, so this and other web sites will continue to be monitored.

> **Update**: During January of 2019, the Omniglot list of Latin languages was reviewed again. That list now contains some 850 Latin language entries, an increase of 100 since the last review was performed. The 2019 review reconfirmed that every letter of every Latin language in Omniglot is supported.

Any user of the Q Keyboard having knowledge of a Latin language not appearing in Part 9 is invited to convey that information to the author, at info@qKeyboard.com so that it could be included in a future edition of the Q Keyboard. Your assistance will be appreciated.

> If you happen to learn about an otherwise undocumented language, please check out the Omniglot web site. If the language is not documented there *either*, the host of that site, Simon Ager, will appreciate any contributions to his efforts that you could provide, as accurate information about unknown or otherwise undocumented languages is hard to come by. Finally, if you happen to learn of a Latin language having any letters that are not supported by the Q Keyboard, please let me know.

A very small number of so-called "Latin" languages exist that also contain letters outside of Latin, Greek and Cyrillic. Such languages are not support by the Q Keyboard. One example of this is the **Latin** Abaza alphabet, which has letters not defined in Unicode (and that cannot be formed from an existing letters plus an accent, either), in additional to Latin and Cyrillic. There is no support for any language with letters outside the three available alphabets. (The ***Cyrillic*** Abaza alphabet is fully supported on the Q Keyboard.)

In addition to what appears below, the Q Keyboard can be used for the alphabets of at least 110 Cyrillic-based languages. See Cyrillic languages supported for more information.

The number of supported languages must be taken in perspective. An ongoing issue world-wide is the extinction of minority languages. Each year there are fewer distinct languages spoken. A number of languages noted in these reference works are spoken by small numbers of people, such as less than 1,000. Some have as few as 10 speakers, who are often elderly. For them, if these elderly speakers do not pass on their language to the next generation, it may also become extinct.

It should be mentioned that the issue of language extinction is controversial, with some experts asserting that far fewer languages die out than some claim, that new languages occasionally arise, and that the very counting of languages is itself an imprecise task, due to lack of complete knowledge about languages, debates as to whether something is a language or 'just' a dialect, and so on.

A few of these entries represent languages that are already extinct, or in some cases, are artificial or constructed. The language Esperanto is used by a number of people, but other constructed languages are rarely used or have been abandoned. Because the Q Keyboard has such extensive features, and requires only an easily-obtained U.S. QWERTY device, it is possible it could play a role in reviving a currently extinct or endangered language.

Another web site is "The Alphabets of Europe" by language expert Michael Everson. This can be found at http://www.evertype.com/alphabets/.

An initial sample of some 70 Latin language descriptions were reviewed. A later sample contained 124 languages using Latin or Cyrillic (some having both alphabets in the same language). As with the Omniglot web site, the languages documented by Everson contained no defined Unicode Latin or Cyrillic letters that the Q Keyboard was unable to type.

Issues with the **Latin Chechen** language are discussed here.

In this table, languages **Using 0 Dead Keys** are termed Live Key Conformant.

Omniglot entries called Latin	604
Language Category	Number of Languages
Languages with accents	**455**
Using 0 Dead Keys	283
Using 1 Dead Key	45
Using 2 Dead Keys	33
Using 3 Dead Keys	20
Using 4 Dead Keys	16
Using 5 Dead Keys	21
Using 6 Dead Keys	2
Using 7 Dead Keys	6
Using 8 Dead Keys	10
Using 9 or more Dead Keys	19
Languages without accents	**134**

Does the Q Keyboard require a hardware implementation?

To use a Q Keyboard as a *software-defined keyboard*, the only hardware requirement is a standard U.S. QWERTY keyboard and the Q Keyboard device driver, operating on a recent release of Windows. No proprietary hardware is necessary.

> The Q Keyboard has been validated successfully on Windows 7 and Windows 10. It is likely to work on any version starting with Windows 7 and later. It is possible that it may work on Windows XP or older systems, but this was not tested, so it cannot be confirmed and is not supported.

The Q Keyboard defines three new kinds of modifiers, called **AA**, **BB** and **CC**. On a *software-defined keyboard*, the design repurposes existing QWERTY modifier keys to make these available.

The keyboard you use must be a standard U.S. QWERTY device, and must have two Ctrl keys and two Alt keys. It must have at least one Windows Logo key on the left side, and may have a second Logo key. Keyboards not meeting these requirements are not supported.

> This requirement will generally rule out the use of real AZERTY or QWERTZ hardware devices, which usually have one **Alt** key and one **AltGr** key, and have other keys in non-QWERTY locations. It would also rule out the use of laptop computers with compact keyboards in which only one Alt key or one Ctrl key is present.
>
> There are a number of QWERTY keyboards that rearrange the keys in order to be more ergonomic, including the *TypeMatrix* keyboard. While their scan code data is compatible with QWERTY, their key layouts are not designed with the use of the AA, BB and CC modifiers in mind, so it may not be practical as a Q Keyboard platform. Devices of this sort are not recommended.
>
> For more information on this subject, see the article Can non-QWERTY devices be used?

On a hardware-defined keyboard, **AA**, **BB** and **CC** exist as separate, discrete modifier keys.

Hardware-defined keyboards do not as yet exist. Making such devices a reality is a goal of the author.

What is a hardware-defined keyboard?

You will find a number of references in this document to a **hardware-defined keyboard**. What is meant by this?

The initial design of the Q Keyboard relies on standard U.S. QWERTY keyboard devices. In order to implement the Q Keyboard design on an existing keyboard, it is necessary to "steal" three keys and make them the **AA**, **BB** and **CC** modifiers. Presently, this is done by "remapping" the left **Alt**, **Windows Logo** and **Ctrl** keys, respectively. This is a practical and workable approach, but it has the drawback of leaving only one set of Ctrl and Alt keys available for their normal functions. That can be inconvenient, for example, when you might need a Ctrl key while using a mouse. If you are right-handed and you are using a physical mouse instead of a trackpad, your right hand will be on the mouse, while you must reach over and hold the right Ctrl key with your left hand. Presently, you must live with that situation, or else temporarily swap out the Q Keyboard for the standard U.S. QWERTY layout.

> This design also means that you will have at most one real Windows Logo key at your disposal. However, the Logo key is not used often, so having just one shouldn't cause too much difficulty. Some new full size QWERTY keyboards don't even have a second Logo, as has been the case with laptop keyboards for some time.

It is desirable to have a device where no standard keys are "stolen". To do that, a new hardware design is required. A keyboard manufacturer would need to add new physical keys to a standard layout, and assign otherwise-unused Scan Codes to those keys, so that the Q Keyboard device driver would recognize them as the **AA**, **BB** and **CC** modifiers.

There is more than one way such new keyboards could be designed. To help you visualize this, the following diagram shows a prototype layout, presented here to give you an **idea** of how such a device might look. The assumption in this design is that a full-size keyboard was being modified, which would also have a standard numeric keypad. Since the numeric keypad would look and operate identically to current keyboards, that part of the diagram is omitted below.

> It is understood that real keyboards have a more subtle key placement than shown in the diagram below, which has adjacent rows shifted by a fixed width of ½ of a key, instead of a more realistic offset of about ⅓ or ¼ of a key. The diagram, prepared on a word processor, is not intended to be a "blueprint" of a keyboard, but simply an approximation of one, for purposes of explanation and discussion.

Applications where compact or laptop keyboards were enhanced to be Q Keyboard compatible would have to make adaptations to what appears below, based on keyboard space availability.

As noted below, this image and the proposed design are Copyright © 2018 Robert Hodge

Hardware manufacturers having an interest in producing devices compatible with this design are encouraged to contact the author at info@qKeyboard.com to discuss licensing and to request technical specifications.

How would such a hardware-defined keyboard operate? When such a device reaches the engineering stage, some of these details may require modification to enable the manufacture of a real product. Because some functionality is so unique compared to existing keyboards, a certain amount of custom digital logic would be required for its controller. This should not be overly difficult for an electronics engineer to design, but it is a cost and design detail that would have to be taken into consideration. At this point, the operational concepts are envisioned to be as follows:

- The **FN** key would enable auxiliary functions, such as Media Control, which would share space with the function keys **F1**-**F12**. **FN** might have other uses as well, such as controlling connectivity options if the keyboard could be connected to its host in more than one way (such as USB, wireless "nano" or Bluetooth) or be connected to more than one host (such as PC, cell phone, smart TV or tablet). A common use for **FN** on some keyboards is a "function lock" or "F-LOCK", used when a typist wished to access Media Control keys most of the time instead of using F1-F12. If F-LOCK were implemented, **FN** plus a function key would enable the "other" use of that key. The precise details of how this might work would need to be determined. Existing keyboards can be found that use FN+ESC to toggle the F-LOCK.

- In order to reduce keyboard physical complexity, the **AA**, **BB** and **CC** keys would share space with **Alt**, **Windows Logo** and **Ctrl**. The left side and right side are separately enabled via the **Mode** keys, a new pair of keys unique to the Q Keyboard. Activation of a set of **AA**, **BB** and **CC** modifier keys would be indicated by the LED light on the **Mode** key next to them. When the LED indicators of both **Mode** keys were off, the keyboard would operate exactly the same as a standard U.S. QWERTY. That way, you could selectively enable or disable Q Keyboard functionality, on one or both sides, simply by tapping on a **Mode** key, instead of requiring an interaction with Windows to accomplish this. Thus, clicking on the Windows Language Toolbar or using a Logo+Spacebar sequence to change keyboards would not generally be necessary.

- The layout is symmetrical, with the Windows Application key relocated to a new **Command Pad**, a set of 5 auxiliary system control keys placed where there is currently unused space between the arrow keys and the 6 formatting and 'motion' keys. For laptop computers and other compact devices, alternative layouts would be required. The term "Command Pad" might also be applied in a more general sense to the entire cluster of 15 keys, consisting of the 10 existing keys and the 5 new ones added with the Q Keyboard design. Keys on the command pad are **not** affected by the **Mode** keys. For instance, the new **Alt** key on the command pad never acts as an **AA** modifier but only as

a conventional **Alt** key.

- To avoid cost and complexity issues, LED indicators depicted as placed on individual keys might have to be located on the keyboard case, or perhaps might only be visible as on-screen software-based indicators. For low-power and wireless applications, use of "E-Ink" indicators that only consumed power when changed may be a practical design option.

The **Mode** keys would have additional functionality.

- Holding both **Mode** keys at the same time would be treated the same as pressing the **Windows Application** key. This would be helpful for laptop computers without a Command Pad, since it might be difficult to otherwise find room for a discrete Application key.

- For laptop computers without a separate numeric pad, current devices often use an FN key to access a group of keys set aside to simulate this. The keys used are often 789, UIO, JKL and M for the digits, and 0, P, semicolon, slash and Enter for other keypad keys. A laptop Q Keyboard would use the left Mode key to operate like an FN key in making these simulated-keypad keys available. It is possible that Mode+NumLock would lock the keyboard in "keypad mode" so you could continuously type on the "keypad" without holding the Mode key all the time.

- Holding a **Mode** key and typing **Q**, **A** or **Z** would select the **QWERTY**, **AZERTY** or **QWERTZ** Regional Layout Variants, respectively. It is possible that additional selections would be allowed to select a Private or User-Defined variant. The keyboard might have an indicator to show which variant was active, if there were room to place such an indicator in a convenient location.

- Pressing **Left Mode**+Spacebar would produce **U+00A0** No-Break Space.
- Pressing **Right Mode**+Spacebar would produce **U+202F** Narrow No-Break Space.

- If a **Mode** key were held and then another key from among the AA/BB/CC keys, it would temporarily invert the sense of that key. For instance, if Q Keyboard mode were enabled on one side, and you wished to temporarily use **AA** as **Alt** without disabling Q Keyboard mode, you would hold **Mode** and then **AA/Alt**. You would then use your keyboard for any sort of shortcut or keyboard command that required **Alt**. Once you released these keys, the keyboard would remain in Q Keyboard mode. The reverse situation would also work, such as for example when the keyboard was in U.S. QWERTY mode and you needed an **ö with Diaeresis**. You would hold **Mode** and then **AA/Alt**, then press the **O** key to obtain the letter **ö**. Once you released these keys, the keyboard would remain in U.S. QWERTY mode.

  The use of **Mode** in this way to invert the sense of a key would be the most practical only when one such key were needed, such as just **Alt**. If you needed to type something requiring **Ctrl+Alt** or **Alt+Shift**, requiring **Mode** in addition to them would be too much

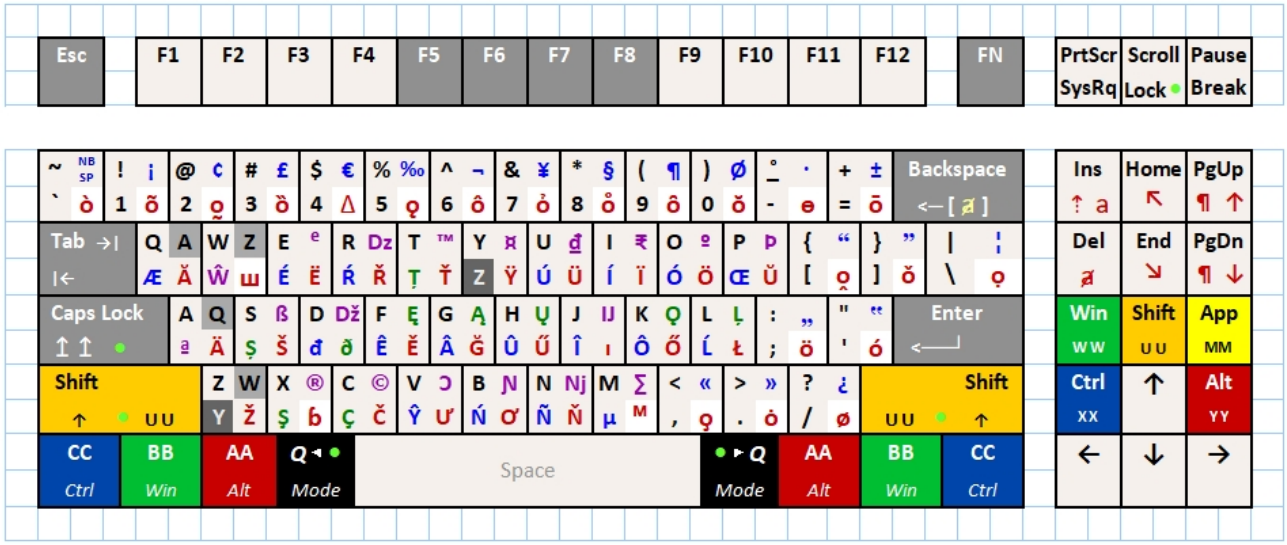
effort for most typists, if you had to hold **Mode** for the entire sequence. Without any other options, this would require a 'persistent' change of mode first, which would slow down your typing a little. To avoid that problem, once **Mode** plus another key were held, **Mode** could be released and its effect 'remembered'. (The technical term for being 'remembered' is "latched".)

For example, suppose you wanted to type **Ctrl+Alt X** while in Q Keyboard mode. To do this, you would (1) hold the **Mode** key with your right hand, (2) hold the **Ctrl** and **Alt** keys with your left hand, (3) release the **Mode** key while still holding **Ctrl** and **Alt**, and (4) type the **X** key with your right hand. This is one possible way to do it. These keying techniques should not be overly difficult to do in practice, once the concepts were understood.

Typists with a full-size Q Keyboard as depicted below could access the **Command Pad** keys without requiring the use of **Mode** for any of the **Ctrl**, **Alt**, **Windows Logo** and **Application** keys.

- Pressing **Mode+Shift** would enable **Shift Lock mode**, and the LED indicators on both Shift keys would be set on. Either Mode key could be combined with either Shift to accomplish this. Tapping on either Shift by itself would disable Shift Lock mode, and the LED indicators on the Shift keys would be set off. Shift Lock mode would cause the keyboard to simulate a Shift key being held while any data key was typed. This would be helpful when using Held Keys to type many capital letters, and for letters on the numeric row or other non-letter keys, where Caps Lock has no effect.

The diagram below shows many of the available key assignments as printed keycap legends, for purposes of documentation. On a real device, management of the keycap space would have to be handled carefully, so as not to overwhelm a user with too many symbols per key. Judicious use of symbol sizes and colors would be required. For full-size keyboards, some legends might appear on the fronts of keys, while keys on compact keyboards and laptop computers are generally more shallow and would likely not have enough room for legible symbols to be placed on the fronts of keys.



One creative possibility to making the Q Keyboard easier to work with is to have a second set of modifier keys. Instead of the three keys AA, BB and CC, there would be six keys, consisting of AU, BU and CU where AA, BB and CC appear below in the diagram, and AL, BL and CL beneath them. This arrangement means that you would not have to hold two keys, like AA+Shift, for upper case letters. That would be especially helpful for ***Held AU*** characters. It would still be necessary to hold two keys for chords like AB and BC.

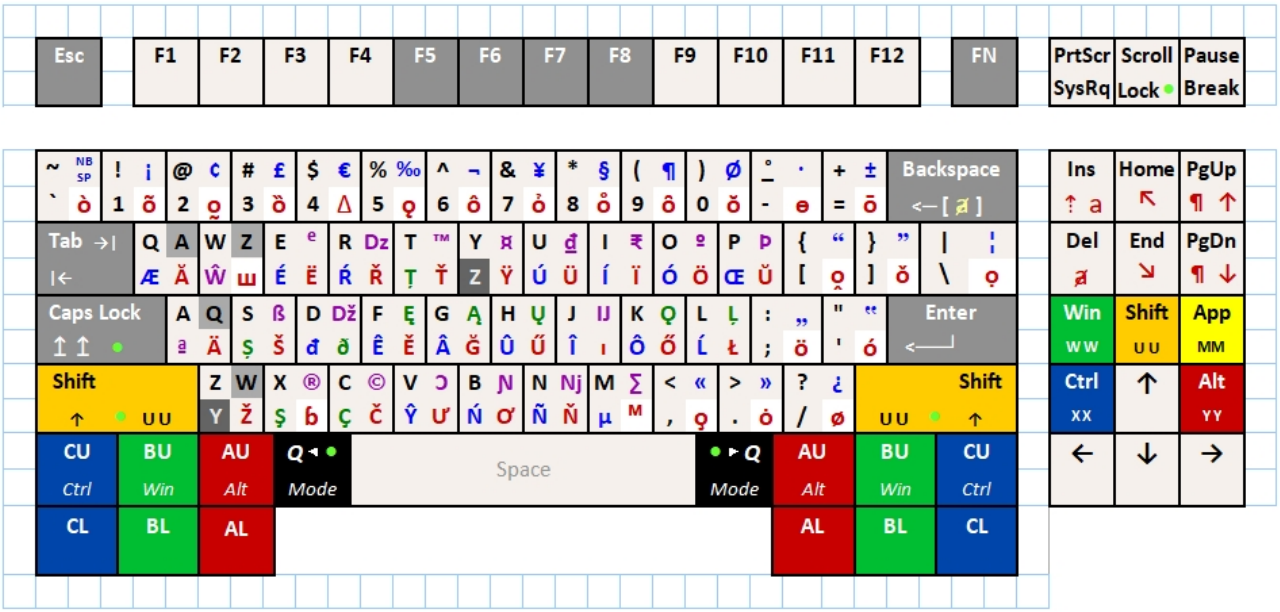
Having this extra set of keys might be most practical on laptop computers, which often come with a large hand-rest area below the keyboard. For these keyboards, there should be enough room available to allow for the extra keys depicted below in the diagram.

In such designs, the Mode keys would only affect the use of AU, BU and CU. It should be possible to devise some inventive key sequences that maximized the use of the Q Keyboard modifiers and the regular Ctrl, Logo and Alt keys. Because this is a feasible but unorthodox design, it may have less appeal than the one above, since it would be more of a challenge to make full-size keyboards made this way.

A **variation** of the diagram below could have AA, BB and CC below, and conventional Ctrl, Logo and Alt keys above. Were that done, the Mode keys could possibly be omitted, since AA, BB and CC would be "on" all the time, and would not need to be enabled and disabled or temporarily overridden.

Here is a prototype design to illustrate these concepts:

The ***Q*** International QWERTY Keyboard · Copyright © 2018 Robert Hodge and Quatras Design · info@qkeyboard.com



Can non-QWERTY devices be used?

The issue of whether non-QWERTY devices would ever be supported is highly dependent on the degree of user interest and feedback received, but at this time it does not seem likely.

The initial design of the Q Keyboard targets standard U.S. QWERTY devices. If the software is operated using a non-QWERTY keyboard at present (such as QWERTZ or AZERTY), it is nonstandard usage that is not supported. Even if it "worked" in some way, the mismatch of keycap legends would make it confusing to operate.

> Non-QWERTY keyboards may have physical keys not present on QWERTY, like the key known as OEM 102, which often has < and > on it, and is to the left of the QWERTY Z key. Keyboards with this key have a very narrow left Shift key. Other keyboards have keys known as ABNT 1 and 2. The Q Keyboard is not designed to recognize or process such keys, and if you pressed them while the Q Keyboard software was running the results would be unpredictable. (Probably, those keys would appear "dead" and inoperable.)
>
> The Q Keyboard currently defines what are called Regional Layout Variants that are similar to QWERTZ and AZERTY, though not exactly the same. The purpose of a Regional Variant is to assist users familiar with QWERTZ and AZERTY by putting **some** important keys in familiar locations, while doing so on a standard U.S. QWERTY device. These layouts are **not** a complete replacement for native QWERTZ and AZERTY hardware, which is what this current discussion is about.

Does this rule out eventual support for non-QWERTY devices sometime in the future, such as QWERTZ or AZERTY? Not necessarily, but certain issues would have to be resolved to adapt the design.

A difficult problem is that QWERTZ and AZERTY layouts are not standardized. France is currently trying to standardize its AZERTY, and other regions have their own versions of AZERTY. Likewise, QWERTZ is perhaps most associated with Germany, but other countries also have their own versions of QWERTZ that are not compatible with the German layout.

> As of the beginning of 2018, the French AFNOR organization approved a new AZERTY standard, but it has not yet been officially published and there are no known hardware implementations generally available. What is currently known of this design is that it too differs from prior AZERTY layouts, creating yet another standard that is incompatible with older devices.

Another difficult problem is that the approach used by the Q Keyboard to relate punctuation keys with various types of accents is not easily adapted. For instance, on QWERTY the 6 key has the ^ on it, which the Q Keyboard uses to associate this key with the **Circumflex Above** accent. On other keyboards, 6 is configured differently, so the

Circumflex would have to be placed elsewhere. However, doing that would **then** conflict with support for fractions, such as ⅚ which is typed by holding ***AA*** and typing **5** then **6**. If the Dead Keys for 5 and 6 were moved, you could not type the fractions this way.

In theory, it is not impossible to relocate things, but it would not be a simple process. Trying to correct the situation described above would result in conflicts, where a character might "need" to be moved somewhere else, but a character was already in that new location and might not itself be easily moved. Resolving these problems would require a long, painstaking process to redesign and reallocate characters to new locations. Again, that is not necessarily impossible to do, but would be time-consuming and labor-intensive. Each version for each new hardware configuration would then have to be extensively tested. Even if we discount the work involved, it is likely some conflicts could not be resolved at all.

Perhaps the biggest problem with using non-QWERTY devices is that the intent would be to utilize the existing accented letters that appear on the keycaps of these keyboards. But, the Q Keyboard doesn't need them. Its system of Live Keys, Dead Keys and Held Keys already addresses the accented letters of every current Latin-based keyboard, and many times more than that. Trying to use such keyboards would interfere with the design goal of avoiding bias. If the Q Keyboard were adapted to use French or German devices, it would then be biased to French or German, and that would make it difficult to be used by speakers of any other language.

Can the Q Keyboard type every Latin language?

The short answer is, there is no way to be sure. It **can** be used to type many Latin languages, and perhaps nearly all of them, but it would be hard to confirm it.

Latin is used for more languages worldwide than any other type of alphabet. Because there are so many, and not all are well-documented, it is difficult to say with certainty exactly how many languages even exist or what all their features are. New ones are being discovered and documented all the time. And, speakers of existing non-Latin-based languages might adopt Latin alphabets, as is currently being proposed for the Kazakh language.

Some Latin-based languages are spoken by small populations and may not have a large body of published literature available (importantly, literature available on the Internet). Sometimes they have so few speakers that their language is essentially unwritten, and language specimens that do exist are mostly from the efforts of linguists and scholars. When that is the case, a language might have no authoritative standardization body and no "official" alphabet, or (worse) more than one. At times, a linguist may design an alphabet for a small language group, only to have another linguist come along and redo the effort, creating a completely different alphabet. Doubtless, such experiences are frustrating to the native speakers.

There are languages that are purportedly "Latin" but were converted from other scripts (such as Cyrillic) and the "conversion process" was incomplete. An example of this is the **Abaza** language. While most of its letters are Latin, others are Cyrillic or Coptic letters, some of which are not defined in the Unicode standard. That is, there are no "code points" for these letters, and they cannot be composed from existing letters and existing accents.

The Abaza language adopted a Latin alphabet in 1932, long before Unicode, but the alphabet was abandoned in favor of Cyrillic. There is thus little need for its archaic, specialty letters in Unicode today, since no one uses them any more. The Latin Abaza alphabet had letters that might be described, in present-day Unicode terminology, as "Latin Letter Reversed F" and "Latin Letter X with Left Horn Above and Right Horn Above". No such letters exist in the current Unicode standard, and there are no published plans to add them.

Because of that, the Q Keyboard cannot be used to type the Latin Abaza alphabet. That would be true of any language having similar issues with their alphabet. Unless the Unicode Consortium defined code points for the letters needed, and fonts were made that utilized them, nothing further can be done. Neither the Q Keyboard nor any other one could be used to type such an alphabet.

See http://www.omniglot.com/writing/abaza.htm for details on the Abaza language.

See also the note below about the Germanic language Hunsrik.

A survey of all characters described as "Latin" in the Unicode standard turns up 1,328 entries. Some letters that actually are "Latin" don't contain that word as part of their names, and so the true count is slightly higher than 1,328. For instance, the symbol ᴬ has the name **U+1D2C Modifier Letter Capital A**, which is clearly a **Latin** letter, but the description doesn't say that.

In contrast, **Cyrillic** modifier letters all have "Cyrillic" in their description, like **U+A69C Modifier Letter Cyrillic Hard Sign**, so Unicode is inconsistent in how it handles this.

The current design of the Q Keyboard makes 1,126 unique Latin letters available, in addition to its other features. This count includes clearly Latin symbols like **Modifier Letter Capital A** noted above.

An article in Wikipedia regarding Latin letters in Unicode cited a figure of 1,350. However, they did their count differently. They included precomposed Roman Numerals as "Latin", but did not count things like Circled Latin Letter A. Likewise, they count Full Width and Half Width forms, while we do not. It is the same set of letters, just taken from two different viewpoints.

Because the Unicode standard is periodically revised (about once a year), and there are many pending proposals to add new characters to the standard, the total number of defined Latin letters will increase over time. However, most Latin languages are already well supported, so the number of new Latin letters that are added will probably be small. For instance, the Unicode standard for 2018 will add only three Latin letters. Newly added letters may be used more by linguists than to support languages in active use. For instance, a letter in the new standard is **Latin Letter Thorn with Diagonal Stroke**. This letter was proposed, not for any current language, but to represent archaic scripts in Old English and Middle English. There is a small handful of other unapproved, pending Latin letters in the Unicode Pipeline, such as Latin Capital Letter Z with Palatal Hook, but they mostly address phonetic representation needs, not letters used in active languages.

What kinds of letters were among the 202 not implemented? They comprise several categories:

- circled letters
- parenthesized letters
- combining letters
- Full Width letters normally embedded in Asian scripts
- some turned, reversed and inverted letters
- some symbols with hooks, legs, tails and belts
- some archaic letters for extinct languages and alphabets
- some modifier letters and combining modifier letters
- some non-IPA phonetic symbols

It should be noted that a large number of such letters, like modifier letters, turned letters and letters with hooks **are** in fact supported, just not all of them.

Even if every one of these symbols could be included, people would probably find it bewildering and overwhelming. Many letters are hard to "characterize". That is, there may be no obvious place on the keyboard to assign them to, and if included, they would have to be put on arbitrary key locations wherever room was available. That would be difficult for users to remember, and most people would never need them anyway. Some archaic letters on **Dead Key 08** were handled that way.

And, if we were to exhaustively accommodate all of those letters, it would crowd out other useful (and more important) characters that are also needed. Even though someone must have thought that every letter approved by the Unicode Consortium was important for one reason or another, some of them are so obscure that the average typist is unlikely to ever use them in their lifetime.

For example, the Unicode symbol defined as **U+A7FF Latin Epigraphic Letter Archaic M** looks like a cross between an **M** and a **W** (or maybe a **Λ** Lambda and a **W**).

How often have **you** needed to use this letter in a document? Neither have I. (In fact, the appearance of this letter in this Help article *right here* is literally the first time the author has ever used this symbol in any document in his entire life, and it didn't even make it here until the Q Keyboard project was already in existence for over two years.)

The point is, these symbols were omitted because they are hard to characterize, and no documentation was found that demonstrated their active use in a current language. There's just no evidence these letters are really needed.

What can be done if you actually do need a letter or symbol not on the Q Keyboard? Many applications have a **Character Map** or **Insert Symbol** feature to select special characters, and some word processors like Microsoft Word allow you to enter any symbol using its hex Unicode number and then typing **Alt X**. That technique may still be occasionally needed on the Q Keyboard, for instance, if one of the many hundreds of math symbols or specialty arrows are required in your document. Because the Q Keyboard does define so many symbols, you will require the **Character Map** or **Alt X** technique much less often than on a conventional keyboard.

When using the **Alt X** technique to enter symbols as hex numbers, remember to use the correct **Alt** key so you don't type **AA X** by mistake. That will not work. You cannot use the **Alt** key that has been remapped as **AA** for this purpose.

Even if a particular application does not have its own Character Map popup GUI window, you can always use Windows' built-in Character Map feature, or one from a third party (like the **BabelMap** program) to place the desired characters into the Windows Clipboard, and then paste them into your application. The author has found

BabelMap to work well and recommends it.

By the way, BabelMap is how the author found and inserted the archaic M letter discussed above. This software is quite handy.

In Windows 10, you can access the Character Map by doing an application search (by clicking on the magnifying-glass icon) and start typing "Character Map". The application should appear after the first few letters, like "**Char**". Then click on that application in the list.

For information on **BabelMap**, see http://www.babelstone.co.uk/Software/BabelMap.html.
Software is periodically updated, so be sure to check if you have the most current version.

A character map utility from SIL International called **SIL ViewGlyph** can be found at http://scripts.sil.org/cms/scripts/page.php?site_id=nrsi&id=ViewGlyph_home. The features of SIL ViewGlyph are not as extensive as BabelMap. You may need to Run as Administrator to successfully install this program.

If you need to enter special characters but can't or prefer not to use a "map" utility, there are key sequences you can use to directly enter them. For more information on this topic, see the web site https://www.fileformat.info/tip/microsoft/enter_unicode.htm.

The Q Keyboard does have a number of features to recommend it.

- The design has been validated against lists of hundreds of languages, from sources such as the Omniglot web site and information compiled by language expert Michael Everson, and many articles from Wikipedia and other sources. The Q Keyboard can be used for all of these. It can also be used for Polynesian languages (too numerous to mention) that share the common traits of using vowels with macrons and raised-commas or apostrophe-like modifier symbols to represent pauses or other language features.

- Speaking of Omniglot, this web site has a unique feature in which you can download a Microsoft Excel spreadsheet file containing the alphabet of a language, including its Latin equivalent (for non-Latin languages like Russian) and the phonetic description of each letter. As part of the Q Keyboard's language validation process, some 750 alphabet spreadsheet files were downloaded for Latin languages described on Omniglot, along with 130 Cyrillic alphabet spreadsheets. The Unicode text of these files was extracted and a composite character usage list created, containing 918 unique letters from those 880 alphabet files. A comparison of this list to what the Q Keyboard supports (as seen in the Appendix) shows that every letter of every Latin and Cyrillic language currently listed in Omniglot (as of March 1, 2018) is fully supported on the keyboard.

- In January of 2019 the Omniglot list of Latin letters, now representing some 850 languages, was reviewed again. This new review reconfirmed that all of the letters for the Latin languages on Omniglot are available on the Q Keyboard.

- The keyboard has an extensive set of characters available via Live Keys, Dead Keys and Held Keys, comprising over 2400 letters and symbols. The actual number of keys defined is larger than this, because of additional, intentionally redundant entries that allow you more than one way to type certain letters, based on convenience. See Q Keyboard statistics for more information.

- When final decisions regarding the Q Keyboard's repertoire of letters were being made, the tentative list of supported letters was compared against the master list of all Unicode symbols (excluding languages and symbols that were not applicable to the design). This comparison provided a means of double-checking to make sure no reasonably useful letter or symbol was overlooked for consideration, even ones that are seldom used or ones not otherwise found in available reference works. And, after extensive modifications and refinements to the keyboard had been made, a comparison against the master list was done *again*, a second time. That close scrutiny - against a list numbering into the many thousands of symbols - did in fact result in a few additional letters being included. By this means, there were no letters that "fell through the cracks" or got inadvertently overlooked by accident. Every Unicode letter that could have even the slightest possible usefulness was reviewed and considered. Each symbol, whether included or not, was decided upon through a careful, painstaking, deliberate review process.

- For letters having no precomposed symbols in Unicode, you can easily add diacritics to a base letter by using one of the large number of available Combining Modifier symbols. For instance, there is no such Unicode letter as **ȕ** with dot above, but one can be created by first typing the "plain" letter **u** and then adding the dot, by holding down the **AA** modifier and typing the period key **twice**. Successful use of combining diacritic symbols in this way is dependent on the quality of the fonts you use. (Some perform better than others. You will have to try it and see how well it works for you. See Font issues for more information.) The example here with **ȕ** uses the Calibri font, which often works well for the more common cases.

It should be pointed out that the language evaluation list mentioned above was very carefully scrutinized for the specific letters being used. In practice, the Latin letters in Unicode that are technical, phonetic, obscure or archaic are not generally encountered in everyday use. Except for a tiny fraction of them (like **Eth**, **Ezh**, **Yogh** and **Thorn**, and a few phonetic symbols present in some African and indigenous languages), modern languages with Latin alphabets almost never use rare letters. You should find that the overwhelming majority of letters present in nearly all contemporary Latin languages are available to you with the Q Keyboard. You can also produce all the symbols for the International Phonetic Alphabet (IPA), and many (though not all) symbols from other phonetic transcription systems.

Linguists, being particularly creative and inventive, not only use every type of phonetic symbol in every transcription system, but may also add modifiers to them to make even **more** symbols. (For the record, this is by no means a subtle disparaging of linguists. The words "creative" and "inventive" are offered in all sincerity.)

The Q Keyboard supports all Unicode letters with dual diacritics used in the Vietnamese language, and other dual-accented letters, such as those used in the (now extinct) Livonian language and in the Pinyin script used for Romanized Chinese (not to be confused with the Pinyin *language* used in the African nation of Cameroon). You can find the complete list here.

The Q Keyboard has an extensive set of Cyrillic letters. Because the only means of producing Cyrillic is with Dead Keys and Held Keys rather than Live Keys, typing will be comparatively slow, and you would likely only use them for short passages, proper names, geographic locations, and so on. Similar to the case with Latin letters, there are a number of archaic Cyrillic letters that are seldom or rarely used. Many (but not all) uncommon Cyrillic letters are also included, while those in active use in contemporary Cyrillic-based languages are well represented. The repertoire is robust enough that even Old Church Slavonic is supported (though not all archaic Cyrillic scripts). There are some languages that have been Romanized from Cyrillic, but still have a few remaining Cyrillic letters. For these, using the Q Keyboard's Cyrillic feature should not be overly burdensome, and should be easier than using a popup Character Map to select them.

You should find in nearly all cases that the letters you need to use are the very ones supported by the Q Keyboard.

Regarding the language Hunsrik

Hunsrik is a West Germanic language based on a dialect of German, which is spoken in southern Brazil. It reportedly has about 3 million speakers.

For more information on this language, see
http://www.omniglot.com/writing/hunsrik.htm

There are two main orthographies of Hunsrik in current use. These are known as **Altenhofen** and **Wiesemann**. Both of these use commonly available letters and accents, and are fully supported on the Q Keyboard as Live Key Conformant languages.

An additional orthography was developed and presented in as-yet unpublished works of **Adriano Steffler**. The Steffler alphabet is unorthodox; it includes letters from Latin, Greek and Cyrillic. In addition, two of its letters are Coptic and Armenian, which the Q Keyboard does not support. If you wish to utilize this orthography, you could adopt the following suggested substitutions.

The reason for not supporting these extra letters is that Steffler's unpublished work is not actively used by speakers of Hunsrik, but is presently an unadopted academic proposal.

For the **Coptic Gangia** (a type of letter **G**) the substitution is its phonetic representation, the **Latin Ɣ Gamma**.

The **Armenian Ini** transliterates as a type of **I**, while it looks somewhat like a lower case **H** or **N**. However, as used in Steffler's alphabet, it represents a Hunsrik **N** sound, which has a phonetic value of **Ɲ**. (That makes use of the Armenian Ini unusual, since it is not the Armenian *sound* being referenced, but its *resemblance* to a letter **N**.) Some possible substitutions are offered. The first is its phonetic representation, the **Latin Ɲ with Left Hook**. The second is a lesser-used letter that somewhat resembles the Armenian Ini, and that is **Latin ɳ with Long Right Leg**. Finally, **Latin Insular R** letter **ꞃ Ꞃ** bears a resemblance, but has limited font availability.

Since letter **Ɲ ɲ** is available as a **Live Key**, it is recommend over use of the **ɳ ɳ with Long Right Leg**, which must typed as a **Dead Key**. Do not confuse these letters with the more commonly used letter **Ŋ ŋ Eng** which is also included in the Steffler alphabet, and is available on **Live Key BB B**.

For Steffler	U+	Description	Case	Use This	U+	Live Key or Dead Key	Description
Ⲅ	03EA	Coptic Letter Gangia	UC	Ɣ	0194	CU X	Latin Gamma
ⲅ	03EB		LC	ɣ	0263	CL X	
Ի	053B	Armenian Letter Ini	UC	Ɲ	019D	BC B	Latin N with Left Hook
ի	056B		LC	ɲ	0272	AB B	
Ի	053B	Armenian Letter Ini	UC	ɳ	0220	AU M N	Latin N with Long Right Leg
ի	056B		LC	ɳ	019E	AL M N	
Ի	053B	Armenian Letter Ini	UC	ꞃ	A782	AU 8 R	Latin Insular R
ի	056B		LC	ꞃ	A783	AL 8 R	

How can the Q Keyboard do what others have not?

The Q Keyboard makes far more letters and symbols available than other international keyboard designs have done in the past. How is this possible?

Most international keyboard layouts use an **AltGr** key to support added characters for regional needs. A few (such as the Canadian Multilingual) also utilize an enhanced **Ctrl** key to provide additional characters.

The Q Keyboard operates differently. Rather than using **AltGr** or **AltGr** plus **Ctrl**, it defines three new modifier keys, known as **AA**, **BB** and **CC**.

By using three modifiers instead of one, and because these modifiers work independently of the existing **Alt** and **Ctrl** keys, many more "modifier combinations" or "shift states" are available. This makes possible a much larger set of letters that can be directly typed as **Live Keys**. The Q Keyboard also supports a large number of **Dead Key** letters, which work similar to conventional international keyboards.

Additionally, an extended type of Dead Key, called a ***Held Key***, makes even more letters available. Held Keys are used to type specialty letters that don't fit into conventional Dead Key categories. Such specialty letters include letters with dual accents, most of which are Vietnamese. Held Key characters also make possible a wide range of math symbols, phonetic punctuation and other lesser-used symbols that would otherwise be hard to characterize or find room for.

> Most of the Cyrillic letters that are not on Key W are available as ***Held Keys*** rather than **Dead Keys**. This was done so as to best utilize the otherwise-unoccupied key locations, and to not interfere with the keyboard's primary mission of supporting **Latin** alphabets. It also helps to place these letters in a more consistent manner, so that on non-Key W, you will normally expect to find any Cyrillic letters defined as Held Keys. In a very small number of cases, Dead Keys are used for Cyrillic instead, based on availability of space on the keyboard.

Because Held Keys offer a secondary way of using the same key locations used as Dead Keys, they effectively double the total number of potential key sequences available to you. There are 24 assigned Dead Key locations, which is a large number of them (more than the well-equipped German T2 and French Bépo have).

Each Dead Key can be used as either upper-case or lower-case, giving 48 possible "states". The Held Keys are used independently of Dead Keys, and doubles that number to 96 possible states. Each state is followed by one of the 47 available "data keys". Thus, the architecture of the Q Keyboard's Dead Key and Held Key system has a theoretical capacity of 96 x 47 = 4,512 symbols. When the Spacebar is included as a data key for use with Literals, the theoretical limit is 4,512 + 48 = 4,560. It is possible to extend this number even further, using special **AL/BL** and **AL/CL** key sequences. Memory constraints and Early Shift

redundancies prevent that many symbols from being defined, but it illustrates the robustness of the design.

That potential capacity is in addition to the hundreds of characters available as **Live Keys**.

Finally, one reason so many characters are present is that the design was deliberately **intended** to reach a wide international audience with as many useful features as possible, and so many more letters were added to it than a typical regional design would have normally included. There are few existing keyboard designs that attempt to comprehensively address a broad international audience, and they support at most a few hundred characters - not thousands of them. Among those are the German T2 and the Finnish Multilingual. While these are fine devices for their intended users, the Q Keyboard is more powerful than either of them, supporting more letters and more languages.

Taken together, these factors account for the large number of available letters.

Why are three modifier keys needed?

Most international keyboards have a few dedicated keys for special accented letters frequently used in their supported language, with others left to **Dead Keys**. This tends to favor a limited group of users, since there is only a finite amount of space on a keyboard to add extra keys beyond the A-Z that appear on QWERTY. For instance, a German keyboard has a dedicated key for **ä with Diaeresis**, and French has one for **ç with Cedilla**, but the German keyboard has no dedicated keys for French letters or vice-versa.

The approach taken by the Q Keyboard is to make available as many letters as possible using "direct access" without depending on dedicated keys or always using Dead Keys. Just as you can "directly produce" a **Capital A** by holding the Shift modifier and pressing the **A** key, you can directly produce a **Lower Case á with Acute** by holding the **CC** modifier and pressing the **A** key. The principle is exactly the same in both cases.

Letters typed by using one of the **AA**, **BB** or **CC** modifiers are just as responsive as ordinary letter keys, and much more responsive than Dead Keys. Letters typed in this way are called **Live Keys.**

By having three modifier keys available, a much larger array of letters can be produced directly as Live Keys, instead of Dead Keys being the only resource available to you. The **AA**, **BB** and **CC** modifiers can be combined with Shift (or in some cases, with each other) to further increase the number of possible Live Key letter combinations.

Because this design makes available a large number of directly addressable letters, many languages will not require the use of any Dead Keys at all. For instance, **Afrikaans, Albanian, Azerbaijani, Croatian, Czech, Danish, Dutch, Estonian, Filipino, Finnish, French, German, Hungarian, Indonesian, Italian, Latvian, Lithuanian, Norwegian, Polish, Portuguese, Romanian, Slovak, Slovenian, Spanish, Swedish, Tagalog, Turkish** and many others can be typed without requiring the use of a single Dead Key.

For more information on this topic, see Language statistics. When a language can be typed without the need to use Dead Keys, it is said to be **Live Key Conformant**. Refer to the article here for a list of languages known to be Live Key Conformant. You should find that if you use the Q Keyboard to type a Live Key Conformant language, it should be nearly as easy as using a native keyboard.

For lesser-used languages, a wide array of Dead Key and Held Key characters and combining modifiers are available. Many languages that do need Dead Keys will generally require just five or fewer of them, and the majority require only one or two, because most of the letters they use are available as Live Keys.

> If we consider the top 155 Latin-based languages reported to have 1,000,000 or more speakers (as noted in available reference works), 123 of them do not require the use of any Dead Keys to type those languages on the Q Keyboard. Of the 32 languages in this

list that do require Dead Keys, 20 of them require 5 or fewer, and 12 required just 1 or 2 Dead Keys.

Why the names AA, BB and CC?

What prompted the decision to call the new modifiers **AA**, **BB** and **CC**?

There are non-English keyboards that have translated some or all of the English labels on the U.S. QWERTY for the various non-letter keys. For instance, many German keyboards have a key labeled **Strg**, an abbreviation of **Steuerung**, the German word for "steering" which can also mean "control". "Steering" is the German way to describe the Ctrl key. This concept is perfectly clear to Germans, but English typists encountering it for the first time will be puzzled by a label like **Strg**, and might wonder for a moment if it meant "Storing" or "String".

> The notion of "steering" is so ingrained that some German **Strg** key caps include an icon that looks like the steering wheel of a sailing ship. The **Strg** key is evidently supposed to help users "navigate" the keyboard.

This illustrates the difficulty of translating key names, and the ideas behind them, into other languages. By the same token, even though English is widely known, not *everyone* knows it, and non-English speakers may have to initially learn what the words "Enter", "Backspace", "Caps Lock" and "Shift" mean in their language.

In the past, when advanced keyboard designs with extra modifier keys had been devised, those keys were sometimes given exotic names like "Meta", "Hyper", "Super" and so on. (A device called the Space Cadet Keyboard was like that.) That is all well and good if only English versions of these devices exist, and only English-speaking persons used them, but such terminology won't work for an international audience.

> It is true that the Q Keyboard has a feature called "Hyper Keys". These are letters and symbols that require three modifiers to be held, those being **AA+BB+CC** or **BB+CC+**Shift. Referring to this usage as "Hyper" is merely a documentation convenience. The modifier keys themselves are not literally called "Hyper". If this documentation were translated into a non-English language, "Hyper Keys" would be referred to by a relatively simple (translated) phrase, such as "Extended Modifiers" or "Triple Modifiers" instead of "Hyper Keys", and the key names AA, BB and CC would be unchanged. See the article Hyper keys for more information.
>
> An early version of the Q Keyboard design had keys called Local, Extra and Favorites. Those weren't much better names than Meta, Hyper and Super.

The labels **AA**, **BB** and **CC** are intentionally simple, with the goal of being easily recognized by speakers of any language, since they are not even *names*, but are more like *numbers*. In effect, AA, BB and CC could be thought of as "Extra Modifier keys 1, 2 and 3". By calling them **AA**, **BB** and **CC**, it is also clear they are not the actual *letters* **A**, **B** and **C**. Further, an explanation of a key sequence like **AA : O → ö** does not require English or any other language to explain. The label **AA** here provides a symbolic description that conveys the

same information to every user, regardless of the language they speak, and it tells them everything they need to know.

> This documentation does not actually use notation like **AA : O → ö** but it is something that others might wish to adopt for training purposes.

Thus, the labels **AA**, **BB** and **CC** are perfectly suited to the Q Keyboard's international audience. They clearly define the keys in question, without complicating the issue with words in English or any other language.

A concept for consideration: Assigning auxiliary labels to other keys

For the same reasons that justify labeling the new modifiers as **AA**, **BB** and **CC**, there is merit in placing a label of **UU** as an auxiliary name for the Shift keys, where **UU** signifies **Upper** case.

> This would also help tie-in the Q Keyboard's convention of abbreviating its modifier keys when combined with Shift. For instance, when Modifier **CC** is combined with Shift, we concisely refer to the combination of **CC+**Shift as **CU**. If the Shift key had an auxiliary label of **UU**, then it would be more apparent why **CC+UU** would be shown as **CU**, just as **AA+BB** is shown as **AB**.

When a hardware-defined keyboard is produced, this is a technical design aspect that is subject to review. It is not an overly important issue, but it could be helpful to some users. It provides a language-neutral way of labeling these keys.

The same concept could be extended to other special keys, such as **WW** for the Windows Logo key, **XX** for Ctrl, **YY** for Alt and **MM** for the Applications (Menu) key as suggested labels. So, the *Control* key would not need to be referred to either as **Ctrl** or **Strg** or a label in any other language, but as **XX**.

> In this documentation, the term "**menu**" as applied to a key **always** means the **Windows Application key**, which brings up a "context menu" for the currently running application. Programmers involved in Microsoft Windows development may be aware that the Alt key is internally referred to as a "Menu key". In the Q Keyboard documentation, a "Menu key" never refers to an Alt or AltGr key, but only to the Application key, which is often marked with an icon having horizontal lines and an arrowhead.

The unshifted state is sometimes treated **as if** LL

While it would be possible for the Shift key to have an auxiliary name of **UU**, there is no "key" to represent the **absence** of a Shift. Still, being able to draw attention to the fact that the Shift is **not** being used is helpful for documentation purposes, to emphasize that **Lower case** is being discussed.

To do that, we say that **LL** means the absence of the Shift key being used. This concept is used primarily in combination with **AA**, **BB** or **CC**. So, just as **CC**+Shift is treated *as if* **CC+UU**, which is then shortened to **CU**, the use of **CC** **without** Shift is treated *as if* **CC+LL**, which is then shortened to **CL**.

> That is, we are **pretending** that a hypothetical key called **LL** exists, even though it doesn't. We then **pretend** that **CC** and **LL** are being "held at the same time" to come up with **CL**. The purpose of all this "pretending" is just to help you remember what "**CL**" means. Think of it as a "teaching aid".
>
> If you dislike the idea of "pretending" about a "hypothetical **LL** key", you will just have to accept that **L** means the Shift is not being used, and let it go at that.

Thus, we can say concisely that **CL 3** produces **£** and **CU 3** produces ³ without having to explicitly discuss or mention the Shift key. **CL** and **CU** alone tell you everything you need to know.

Why is AltGr not used?

Many international keyboards utilize an **AltGr** key as an additional modifier, to make additional non-English accented letters available. (This key is pronounced "Alternate Graphic" or "Alt Graph".) AltGr takes the place of a right Alt key on the keyboard. Some keyboards also repurpose a Ctrl key (usually the right one) as another modifier. The Canadian Multilingual keyboard does that.

An AltGr key operates as if an Alt key and a Ctrl key were being pressed at the same time. The host system does two thing to be able to distinguish an AltGr from Alt+Ctrl:

- First, the keyboard device driver software is configured to **expect** the presence of an AltGr. (Technically, the hardware Scan Code is the same as a Right Alt key, but that gets superseded by its use as AltGr.)

- Second, when AltGr is pressed, the data that represents this "keyboard event" is altered, so it appears that the **Right Alt** key and the **Left Ctrl** key are being pressed at the same time, rather than **Right Alt + Right Ctrl**. This takes into account that a typist would not normally hold Alt and Ctrl keys from opposite sides of the keyboard, because it would be too hard to do. All this is "behind the scenes" software at work, allowing it to detect this unusual event and conclude from it that you are actually holding the **AltGr** key and not separate Alt and Ctrl keys.

Why does the Q Keyboard **not** take this approach? There are several reasons.

1. The Q Keyboard is intended to operate as a standard U.S. QWERTY when its extended features are not being used. There is no **AltGr** key on a U.S. QWERTY, and so adding one would change the functionality of the keyboard in a fundamental way that users of the U.S. QWERTY would find surprising and unexpected, and it would likely cause many applications to malfunction. Further, since one **Alt** key is being "stolen" for use as the **AA** modifier, the other key must be a standard **Alt** and not an **AltGr**, otherwise there would be no usable **Alt** key remaining available.

2. Use of AltGr is known to cause compatibility problems with some software. Applications such as word processors and browsers often use key sequences like **Ctrl+Alt+Y** as a "shortcut" to access some specialized function, like performing an application-specific operation on a file. They also have to accept non-English letters that are defined on international keyboards, when the user wants to enter special text. In the case of the Q Keyboard, the equivalent of **Ctrl+Alt+Y** is **CC+AA+Y** (that is, **AC Y** in our usual notation) which happens to produce the **¤ Generic Currency** symbol.

A problem may arise when software cannot tell the difference between **Ctrl Alt Y** and **AltGr Y**. To distinguish them, software must very carefully inspect the returned keyboard data, making note that the "modifier bits" are slightly different in the two cases. Not all software does this properly, if it was not designed ahead of time with the use of

international keyboards in mind. The result is that **AltGr Y** might be treated as the *shortcut* **Ctrl Alt Y** rather than **¤ Generic Currency** (or, vice-versa). Thus, either you would be unable to type some special characters into your application, or some application shortcuts would not work. Not all software has this failing, but some do, including well known word processors, text editors and Internet browsers. Since software is constantly altered and improved, you need to know your environment to confirm what will and will not work for you.

Confusing of AltGr and Alt+Ctrl is an industry-wide software design problem that has existed long before the advent of the Q Keyboard.

3. Even if point 2 could be overcome, keyboards with AltGr keys are limited as to how many characters they can directly produce. A very small number of letters can be made available that are comparable to how it is done with Live Keys on the Q Keyboard, and everything else must be typed as Dead Keys. The result is that AltGr keyboards are generally "Live Key Conformant" (in the Q Keyboard sense) **only** with the language they are designed for, such as French or German. In contrast, the Q Keyboard is Live Key Conformant with hundreds of languages. (For the precise number of Live Key Conformant languages, refer to "Using 0 Dead Keys" in the article Language statistics.) Even when an AltGr design adds a repurposed Ctrl key (like the Canadian Multilingual keyboard), it still does not provide access to as many characters as the Q Keyboard does.

For these reasons, use of AltGr is seen as an inadequate solution. It is too limited and too susceptible to software compatibility problems to meet the design goals of the Q Keyboard.

Why is only AA used like AltGr?

A careful reader of this Help will notice that the Q Keyboard's **AA** modifier acts, in many ways, much like an **AltGr** key does on other keyboards. That is, AA or AA**+**Shift is the starting point for the many **Dead Key** and ***Held Key*** letters that are available. The AA key is also used for some **Live Key** letters like **ö** which is typed as **AA O**.

Since there are **three** modifier keys, plus Shift, why wasn't **BB** or **CC** also used for some **Dead Key** and ***Held Key*** letters? Is there any technical reason why that couldn't have been done?

If you look at all the of available modifiers, there are a total of **13** different possible combinations, which are discussed here. Any Live Key location for any letter could, **in theory**, be changed into a Dead Key sequence.

Why weren't they? Would there have been any benefit to it? No.

Mainly, it would be confusing. Right now, you know that **AA** or **AA+Shift** are the only starting points for a Dead Key or Held Key. If other Dead Key starting-points were added, it would greatly increase the complexity of the keyboard and make it harder to explain and document. It would add even more to the list of details you had to remember, on a keyboard that is already quite involved.

The furthest that the Q Keyboard design goes toward using 'unorthodox' key sequences is in its handling of Secondary Literals and Bidirectional text control codes, which use **AL/BL** and **AL/CL** to type. Even this feature was added only because no other practical alternatives were available. See Understanding modifier key notation for more information.

Three years of experience in working with and testing the Q Keyboard design seems to confirm that the current use of **AA** alone for Dead Keys is the right approach.

The case of the accent/tilde key

The one Dead Key that has been challenging to handle is the **`~** key in the upper-left corner. The problem is that, unlike other keys, this one could legitimately be considered to have two viable accents: **Grave** and **Tilde**. The current design of the Q Keyboard mandates one and **only one** Dead Key per physical key. The choice was made for this key to be the **Grave** accent Dead Key, with its neighbor key **1!** being used for **Tilde** accent.

Right now, when CC is used with this key, it produces Non-breaking Space or Narrow Non-breaking Space, depending on whether Shift is used. In theory, we could turn this into a Grave dead key using CC, and have AA be used for the Tilde.

Aside from being a good deal of work to reorganize things, such a change would break the design rules for the keyboard that have existed for some three years. It would also disrupt the documentation strategy, which is dependent on one key having at most one diacritic accent. It's not something the author would embark upon lightly.

For now, that kind of change is not going to be attempted. Once the Q Keyboard is in the public domain and has undergone some real-world operational experience, feedback from users will guide any future restructuring along those lines.

See also Assigning Diacritics to QWERTY keys for more information.

Where is my Windows Logo key?

On the current Q Keyboard design, the left (or only) Windows Logo key is remapped as the **BB** modifier, so that key is no longer available as a Windows Logo.

Since the left Logo key is used by the Q Keyboard as the **BB** modifier, you can easily tell if the Q Keyboard software is **in effect** at any given time (once it has been installed, of course) by tapping on the left Windows Logo key. If you see the Windows Start Menu popup displayed on the screen, the Q Keyboard is not active, whereas if **nothing** seems to happen, the Q Keyboard features should be enabled and ready to use. Tapping **BB** does "nothing" in the same way that tapping the Shift key by itself does nothing. It's only useful as a "modifier" that affects other keys.

You need to decide how you want to handle the absence of the left Windows Logo key.

Computer keyboard products are undergoing change. It is becoming more and more difficult to find new keyboards having all of the keys present on a "classic" PC/AT 104 design.

You cannot use older PC/AT **101** keyboards, because they lack the Windows Logo key.

The biggest changes have been caused by the popularity of laptop computers and compact external wireless keyboards, in which space is at a premium. These devices will seldom have a full complement of all of the "classic" keys. Some keys that had meaning in the days of MS-DOS are slowly being dropped, such as Pause, Sys Req and Scroll Lock. Even the function keys F1 to F12 are being minimized or combined with other functions like media control. So, keyboards have fewer and fewer 'expendable' keys that might be "stolen" to be remapped as a replacement Windows Logo. Some wireless keyboard do not even have a Windows Application (App or Menu) key, in addition to not having Pause, Sys Req or Scroll Lock. For such devices, your only alternatives may be to live without the Windows Logo key functionality altogether or use a different keyboard.

In this documentation, the term "**menu**" as applied to a key **always** means the **Windows Application key**, which brings up a "context menu" for the currently running application. Programmers involved in Microsoft Windows C/C++ development may be aware that the Alt key is internally referred to as a "Menu key" with a "virtual key code name" of VK_MENU. In the Q Keyboard documentation, a "Menu key" never refers to an Alt or AltGr key, but only to the Application key, which is often marked with an icon having horizontal lines and an arrowhead.

IT workers from the "Baby Boom" generation may have used PC keyboards to access IBM mainframe computers using a protocol known as 3270 Terminal Emulation. The function keys F1 to F12 and the Sys Req key were part of that protocol, which is why IBM made sure those keys were present on the first PC keyboards. This is still done in

some large corporations, but few of the young generation of computer users today need to access a mainframe or use 3270 Terminal Emulation, or even know what it means. It's part of the ancient history of computers, which explains why these keys are being removed from newer keyboards.

Finding a replacement for the Logo key is important when running on Windows 10. That is because the key sequence of **Logo + Spacebar** allows one to quickly swap keyboard layouts. If you use the Q Keyboard facilities only occasionally, you will likely need to swap layouts several times a day. This is something that can be done with the mouse on the Language Bar, but being able to do this from the keyboard is useful, both for convenience sake and for users that are unwilling or unable to use a mouse.

There are five approaches you can take to handle this, which result in five different "types" of Q Keyboards. This is discussed in more detail under Regional Layout Variants.

Be sure to test the layout you choose for compatibility

Remapping of keys is a software technique that has been used for a long time, and generally works well. However, you may find that it doesn't work perfectly, or perhaps doesn't work for an application you use. At issue is how well your applications work when one or more of the Windows Application, Scroll Lock or Print Screen keys is remapped to other functions. These **should** work - but you must confirm this. If you find one version doesn't act the way you expect, you may wish to try a different Q Keyboard version, perhaps the one where the Logo key is not replaced.

Sometimes, compatibility problems can arise from keyboard hardware that is not in compliance with published standards, or some software may be misinterpreting keyboard data. You may wish to update your software if it is not the current version, or try a different keyboard. If you encounter issues that you cannot resolve, you should post a message on the Q Keyboard support forum.

The articles Keyboard compatibility and Software compatibility may be of help to you.

Be advised that the Q Keyboard software **does work**, having been in operation and tested for three years on various keyboards and operating systems. Unresolved compatibility issues should be rare, and hopefully that will be the case with you as well.

Approach 1: Do not replace the lost Windows Logo key - Type IK

If you have a full-size keyboard with two Windows Logo keys, simply use the right-hand one as Logo. This scenario is the ideal solution when you have such a keyboard, since it makes the fewest changes to how keys are mapped and does not remove any functionality.

If your keyboard has only one Logo key, but you seldom or rarely use it, you might be able to live without the Logo. That might be the case if you were a long-time Windows user who never adopted the newer shortcut methods involving the Logo key. (That describes the author.) If your keyboard has only one Logo key, but you are willing and able to use the mouse to do keyboard swaps, or don't need to swap very often, this may be a good choice.

If you only want the "plain" function of bringing up the menu that appears when Windows Logo is pressed alone, you can type Ctrl+ESC. However, if you need the more advanced features of the Windows Logo key, Ctrl+ESC will not be enough. For instance, **Logo+R** is used to bring up the Windows **Run** dialog. Ctrl+ESC cannot be combined with **R**, since Ctrl+ESC does not look like a "modifier key" but is a key sequence. Thus, you cannot use Ctrl+ESC to launch the Windows **Run** dialog. (Unfortunately, Windows has no provision for a substitute Logo key position that retains its full functionality.)

> Reminder: When typing Ctrl+ESC while the Q Keyboard software is running, be sure **not** to use the Ctrl key currently mapped as **CC**. **CC+ESC** is defined within the Q Keyboard system as an ordinary ESC character, but it would not have the "Ctrl attribute" associated with it. So, CC+ESC will **not** bring up the special Windows menu, but will act as if you just typed the ESC key alone.

For persons who must use the keyboard exclusively and are unwilling or unable to use a mouse, Approach 1 with a full-size keyboard having two physical Windows Logo keys is probably the best choice.

<u>Approach 2: Use Scroll Lock key as a replacement for the Windows Logo key - Type SL</u>

The Scroll Lock key has seldom been used by any software from the days of MS-DOS onward, and its use is even more rare on Windows. If you have a keyboard with a Scroll Lock, you can use that as a Windows Logo key. You will have to install a specific version of the Q Keyboard software to allow this. There are a few issues to be aware of if you do.

First, a true "classic" keyboard that has a stand-alone Scroll Lock key will also have two Windows Logo keys. If so, you would not need Approach 2. Some newer keyboards have a "near-classic" layout that omits the right-hand Windows Logo but does include a Scroll Lock, so if you had one of these, Approach 2 might be a good option.

Second, if you have a laptop computer in which the Scroll Lock is accessible only while holding an **FN** key, you would not be able to combine that with another key. For instance, if you hold a normal Windows Logo key and type **R**, the "Run dialog" appears. That action requires the Logo key to be used like a modifier key (similar to a Shift). You could not type a remapped Scroll Lock key as **FN+Scroll Lock+R**, because the part with **FN+R** would be an illegal key combination. In this case, the best you could do is type **FN+Scroll Lock** to get the "main" Windows Start Menu popup. But, you can already do that by typing Ctrl+ESC as noted above. If that was all you were able to do, this approach would not be very helpful.

Third, there are a tiny number of applications that actually **do** use Scroll Lock, and Approach 2 would take that key away. Should this issue affect you, Approach 1 may be a better solution.

Approaches 3 and 4: Use the Windows Application key as a replacement for the Windows Logo key - Type AP/AS

The App or Menu key has an icon with several horizontal lines and often an arrowhead. This key is more likely to be available on most current keyboards (though surprisingly, not all of them). If present, it will always appear as a "stand alone" key (not requiring **FN**), and will work properly as a complete replacement for all the functionality of the Windows Logo if remapped. If you wish, you can use the Application key as a Windows Logo key. You will have to install a specific version of the Q Keyboard software to allow this.

Most users should not have difficulty with this method. The App or Menu key is intended as a keyboard alternative to clicking the right mouse button on the currently active window, to display the "current context menu".

The only drawback to Approach 3 with type AP is that the physical Application key itself would no longer be available for its original purpose. (It would also not be available for any **other** purpose, if you had some software that did its own keyboard remapping and handled the Application key in some unusual way.) If you are a person who is unwilling or unable to use a mouse, Approach 1 will probably work better for you.

To overcome this drawback, a variation of type AP is type AS. Like AP, AS maps the Application key to the Windows Logo, and then maps the Scroll Lock key to the Application key. Type AS is a separate version that has its own installation.

> Why not just use Scroll Lock as the Logo key? As noted above, the physical Scroll Lock is sometimes shared with something else, like Num Lock, requiring use of an FN key. Because the Windows Logo key must be able to operate as a modifier key, it cannot be activated using FN. However, Application is not a modifier key, but simply signals to Windows to open the current context menu, the same as using a right mouse click. So, even if Scroll Lock requires FN on your keyboard, it will still work as an Application key. Testing on a laptop keyboard that required FN to access Scroll Lock confirmed that this will work.

The choice between type AP and type AS depends on if you have a physical Scroll Lock key and are willing to give it up. Type AS can also be used on a keyboard without a Scroll Lock key. It would work correctly, but you just wouldn't be able to use a key you don't physically have.

Approach 5: Use the Print Screen key as a replacement for the Windows Logo key - Type

PS

Certain compact wireless keyboards have so many "classic" keys removed that there is nothing else left to use but Print Screen. If you wish, you can use the Print Screen key as a Windows Logo key. You will have to install a specific version of the Q Keyboard software to allow this.

Taking away the Print Screen key as a replacement for the Windows Logo is an undesirable option, but it might be necessary if the other methods won't work for you. This would of course remove the Print Screen capability itself, so if you ever **did** need to Print Screen, you would have to swap back to a standard keyboard layout first. If you rarely need the Print Screen function, it's possible that this approach might be acceptable, but it would have to be considered as a drastic, "last resort" choice. You wouldn't want to do it if any of the other ways were available.

Because Type PS has so many limitations, you may be better off using Type IK and clicking on the ENG icon in the language bar instead of remapping Print Screen.

Note 1: The considerations above apply only to the *software-defined* Q Keyboard. A hardware-defined Q keyboard having discrete **AA**, **BB** and **CC** modifiers does not take away the Windows Logo or any other keys, and so potential compatibility issues would not arise.

Note 2: This documentation frequently refers to the Windows Logo key as "**Logo**" for short. You may encounter other documentation that refers to this as the "**Win**" key. These are two names for the same thing, being the key with the "flag-like" icon on it. We use "Logo" instead of "Win" because the full name of the Application or Menu key is the "Windows Application" key. So, "Win" as the name of a key is ambiguous, while "Logo" can only mean one of the Windows Logo keys.

Why is the use of diacritics different?

The Q Keyboard handles diacritics somewhat differently than other international keyboards. The main reason for this is to prioritize use of the keyboard in favor of "direct-access" **Live Keys** over **Dead Keys**.

For instance, some keyboards have a Dead Key for Double Acute, but not for the less-used Double Grave. (Some languages utilize Double Grave letters for academic literature or dictionaries, but not in everyday use.) The Q Keyboard provides both on a single dead key. The Unicode standard only defines two letters with Double Acute, those being the letters **Ő** and **Ű** that are used in Hungarian. The Q Keyboard allows you to type them as **Dead Keys** using **AA 3 O** and **AA 3 U** respectively.

As **Live Keys**, ***ő*** is typed as **AL K** and ***ű*** is typed as **AL H**. These are known as Southwest Vowels. Most typists will prefer the Live Keys, since they are less effort to type, once they get used to using keys **K** and **H** instead of **O** and **U**.

Because letters **O** and **U** have both a Double Acute form and a Double Grave form, some means is needed to type the Double Grave **ȍ** and **ȕ**. To do this, **ȍ Ȍ** is typed as ***Held Key AA 3 O*** and **ȕ Ȕ** is typed as ***Held Key AA 3 U***. This is inconsistent with the other Double Grave letters. However, because Double Acute **ő Ő** and **ű Ű** are used frequently in Hungarian while Double Grave letters are seldom needed, this seems like a reasonable compromise to allow Hungarian speakers have an easy-to-remember dead key for their letters.

There are other cases where Dead Keys are shared. For letters with Macron and Line Below diacritics, it turns out that no letters exist in Unicode that have both forms. For example, there is an **Ā** with Macron, but there is no such letter in Unicode as "A with Line Below". We can use that fact to easily make a single Dead Key work for both purposes. Likewise, there are no such letters as **U with Cedilla** or **O with Cedilla**, and we can use this fact to put **ư with Horn** and **ơ with Horn** on the Cedilla dead key, especially since both the Cedilla and Horn are accents with shapes that resemble a **Comma**, where the Cedilla Dead Key is located.

While there is no **precomposed** Unicode letter for it, you can intentionally create an **A̱** with a Macron Below or a Line Below by using a combining diacritic or with a Hyper Key. These topics are discussed in other sections. (Macron Below and Line Below are similar, with Line Below usually being slightly wider.)

It is true that linguists and scholars seem to use every conceivable combination of diacritics on every letter imaginable. When they do so, it's usually to convey very technical phonetic information to other experts like themselves, or to do things like typesetting a dictionary. The average speaker of a language would never use such notations, because they simply don't need them.

Would the Q Keyboard design run into problems if someday a commonly used letter *did* require both a Macron Above form and a Line Below form? No. In the short term, you could just use a combining accent to produce the letter you needed. Long term, the Dead Key would probably be redefined in a subsequent revision of the keyboard so that one of the letters was a Held Key. For instance, there is a **Dead Key ü with Diaeresis** and a ***Held Key*** **ṳ with Diaeresis Below**, both on key 29. Any new keys on Macron or elsewhere could use the same approach to resolve problems like this. See What happens if the assumptions change? for more information.

The subject of Cedilla accents is complicated. In the Romanian language, the preferred use of accented **S** and **T** is with **Comma Below**, not with **Cedilla**. When Unicode was first created, computer companies and font developers incorrectly assumed that the accents on the Romanian S and T were Cedillas (or, just minor variants of them), and so that's how they were defined. Only later was this corrected.

Some reference works claim that T with Cedilla is not part of any language, and is present only as a Unicode mistake. Yet, T with Cedilla exists as part of the General Alphabet of Cameroon Languages, in some Gagauz orthographies, in the Kabyle dialect of the Berber language, and possibly elsewhere. Not all languages are well-documented, some are documented incorrectly, and some reference works have been written by non-experts that misunderstood a given language's orthography.

On the other hand, Latvian letters like **Ķ Ļ** and **Ņ** that are called "with Cedilla" in Unicode are commonly rendered as if a Comma Below in most fonts, because that is what Latvian writers expect. This can be confusing to typists when first working with these letters.

Why are letters that clearly show a **comma** below called "with **Cedilla**", when there are no corresponding **K L** and **N** letters that actually *do* have a Cedilla? There is no good answer for this, except that the Unicode Consortium may have failed to exercise due diligence during its early research into these letters, and now we have to live with this mistaken terminology. (Unicode never changes the name of a letter once it is published, even if that name is found to be wrong or misleading). It is an unfortunate fact of life that the Unicode standard is neither perfect nor consistent.

The Q Keyboard design takes the position that if the Unicode description says "with Cedilla" then that's what gets produced by the **Dead Key** combination of the **AA** modifier plus the **comma** key, regardless of whether a font is likely to render the character with a Cedilla or a Comma Below accent.

There are only two letters currently defined in Unicode as **Comma Below**. These are **S** and **T**. These may be typed as **Live Keys** using **BB S** and **BB T**, or as ***Held Keys*** using ***AA , S*** and ***AA , T*** •

To type **S with Cedilla** as a **Live Key**, use **BB X** •

To type **T with Cedilla** as a **Live Key**, use **AB T** for lower case **ţ** and **BC T** for upper case **Ţ** •

S with Cedilla is used in Turkish and related Turkic languages.

S and **T with Cedilla** are available as **Dead Key** letters on **AA , S** and **AA , T** •

What happens if the assumptions change?

If you read the Q Keyboard documentation closely, you may notice that a number of its design features are based on assumptions that could change, such as the number of letters having certain diacritics, which allows us to share the usage of Dead Keys.

What would happen if any of these assumptions did not continue to hold up? The same as would happen to every other keyboard if circumstances changed: Nothing.

Keyboard device drivers are simply software. If the world changes, software has to be updated, and until it is, that software continues to do what it always did. Some years ago we had a chance to observe this when the Euro symbol was introduced. It took many years for the computers of the world to catch up.

French speakers are already dealing with a comparable situation, since their current AZERTY keyboard does not provide everything they need. (That is why the French standards group AFNOR was commissioned in 2016 to develop a new French keyboard standard, to resolve these very problems.) They cope now by using another keyboard, or by bypassing the problem with software, or by doing without and typing documents that don't fully adhere to their language standards. Users of software like Microsoft Word can use an Insert Symbol dialog as a workaround, to enter characters not present on their keyboard. That workaround is slow and unpleasant to use all the time, but at least it's possible. Software that allows for keyboard macros can automate some of this, so that the workarounds might not always be difficult to use. However, macros are not available in all contexts, so macros alone can't fully solve the problem.

The Q Keyboard cannot guarantee it will always be optimal or fully support every language group, since nations can and do revise their alphabets at times. And, not all languages are well-documented. There may be Latin-based languages that the author is not aware of, having unknown requirements. It's possible that the Q Keyboard software could be updated to cope with such changed conditions, or perhaps not. Circumstances would have to be evaluated at the time.

However, there are good reasons to believe the Q Keyboard can adapt to future changes:

- The Q Keyboard already has a ***lot*** of characters defined - over 2400 of them. (See Q Keyboard statistics for details.) Chances are good that speakers of a language that chose to add new Latin letters to their alphabet, or change their alphabet to Latin from a non-Latin one, would pick letters that were already defined on the Q Keyboard. That is another way of saying that a given language group has an extremely strong incentive to only add letters to their alphabet from the list of Unicode-defined letters that already exist, and not to make up some new symbol no one else was using. The Q Keyboard has very good support for the Latin letters in Unicode.

- The Q Keyboard is well equipped with a large selection of combining modifiers, as

discussed here and here. If what you need can be expressed as an existing letter plus any of these combining modifiers, you should be able to type the letters you require. For instance, there is no such Unicode letter defined as **U with Dot Above**, but you can easily type **u̇** using **u** plus a combining Dot Above.

- It is possible to use Held Keys. Normal Dead Key usage calls for the **AA** modifier plus a diacritic key to be pressed. These keys are then both released and then the final letter key is typed. Using a ***Held Key***, you **continue to hold the AA modifier key** until you type the final key. In this way, it may be possible to add a letter using the same or similar key sequence, if needed, to accommodate new requirements.

  For instance, the Q Keyboard has one Dead Key for **Diaeresis**, which is on the colon/semicolon key, yet the letter **U** has two diaeresis forms - one with the accent **ü** above and one with it **ṵ** below. The Diaeresis Below letter is typed as a ***Held Key***. The same method could be used for the **=+** key that is used for both Macron and Line below. If someday a letter were added that had both forms, one could be a Dead Key and one a Held Key.

  It should be added that there are **no** current or near-term plans for Unicode to add a new Macron or Line Below letter (like **a̲** with Line Below) where its "opposite" already exists (like **ā**) that would impact the present design of the Q Keyboard. There is nothing to be concerned about at this time. If any currently active language had needed such a letter, it would already be defined in Unicode. The fact that there aren't any indicates the likelihood of it ever happening is small.

- Some of the existing Dead Key categories on the Q Keyboard are underutilized. It is possible that a new symbol might be inserted into an underutilized Dead Key category without disturbing the existing design. The location where such a new symbol might get inserted may or may not be the most obvious or intuitive one, but at least users would be able to type the letters they needed.

- Compromises could be made, so that a letter now available with Live Key direct access might be made available only via a Dead Key, and then its Live Key keyboard position could be given up to make room for some newly-devised letter that was deemed more important (or vice-versa). That would only be done if the number of speakers of the language warranted making that change. It would be carried out as fairly as possible, but doing so would always involve a judgment call as to what was best.

- There are certain redundancies between the letters defined as Live Keys and as Dead Keys. If room needed to be freed up for something else, either the Live Key or the Dead Key instance of the letters could be removed, and some new, yet-to-be-determined letters could take their place.

- Similar to redundant characters, the Q Keyboard has a number of special-purpose punctuation and math symbols that may be of limited interest. With feedback from users, it may be determined that some of the symbols on the keyboard are not needed

> by enough people to justify keeping them. During the design phase, certain symbols got added, then deleted and then added back again, because of uncertainty as to the usefulness of the character.

In addition, the largest language groups (and many smaller ones) already have support for the letters they need on the Q Keyboard design as-is. Because of the large size of these groups (such as French, German and Spanish) they are unlikely to change the letters they use very much - if at all - because of inertia. Of these three, German recently added one letter, the **ß** Capital Eszett, to its alphabet after years without change. The others languages have not added **any**.

> In past centuries, literacy was often limited to the wealthy and privileged. In those circumstances, the specific letters used in a language could be changed somewhat more easily if the scholars of the day deemed it important. In our modern, educated, Internet-connected world, with a vast body of history and literature available at one's fingertips, the impact of a language group changing their alphabet is far greater. People are committed to the language they are using the way it is, and are more resistant to change, resulting in the underlying alphabet usage being much more stable.

For example, suppose a language added a Macron letter that only exists now as a Line Below. How could the Q Keyboard cope? The new letter would be added as a Held Key instead of a Dead Key. In a number of cases, the corresponding Held Key slot is not currently occupied, so the change would be easy. For other letters, some other characters may be in those Held Key locations. If they were not critical letters or symbols, they would just get relocated elsewhere. Some letters would be a challenge. For instance, there is already a Dead Key R with Line Below, and a Held Key R with Macron and Dot Below. If a language added an R with just Macron, the new letter would have to have a new place found for it not on that R key. It might end up on a "neighbor" key, or on an R key belonging to a different Dead Key. These are all solvable problems, with some cases easier than others. At worst, the Q Keyboard might not be able to directly support some new letter initially, but you would have to add a combining modifier until such time as a resolution could be devised.

The Q Keyboard cannot do everything, and some day the design may run into difficult challenges. Right now, there is little risk of that happening. What is more, the Q Keyboard would not be the only device that had a problem; every keyboard in the world would face the same issues. That is one reason why language groups are avoiding controversial choices when making changes to their alphabets, to avoid that very problem.

We should also bear in mind that certain types of accents have not currently been placed on certain letters for good reasons: They are not attractive, are not legible, are ambiguous or would cause other problems. For instance, it is conceivably possible to put a Dot Above on the letter L, but none is present in Unicode. Why not? Most likely it is because there is too great a risk of the lower case L with a Dot Above being confused with a lower case `I`. And, there is already the Capital `I` with Dot Above used in Turkish, that would be *extremely* similar to a lower case L with a Dot Above in some fonts, if one existed. Instead,

we find that there is a letter l· L· with **Middle** Dot, a form that would not be confused with another letter. If there were a great need and value to having many additional accented forms, they would have been added to Unicode long ago, but that has not happened.

And, the modern trend in languages is to make them *simpler*, not more complicated. Letters in some languages have been removed or replaced with simpler ones that are currently in use by other languages. Other trends include the avoidance of dual diacritics and confining the use of diacritics to those that already exist in Unicode, to help promote the use of the language on the Internet. Some language groups have gone even further, and have restricted the character set of their alphabet to only those letters that exist in ISO-8859-1, to ensure maximum compatibility with the Internet. (The Q Keyboard is fully compatible with ISO-8859-1.)

> Languages based on the Cyrillic alphabet unfortunately do not share those trends. Various regions that have adopted Cyrillic in ways that differ from Russian do not tend to add diacritics (except in rare cases) but instead devise **new** letters that are variations of old ones. (That is one reason why there are so many different kinds of Cyrillic letters.) If this continued and more new Cyrillic letters were created, the Q Keyboard might or might not be able to support them.
>
> In contrast, during 2018 the nation of Kazakhstan announced a completely new Latin alphabet to replace their Cyrillic one. In their new alphabet, **not a single letter** was proposed that did not already exist in Unicode.

These trends mean that alphabets in current use are likely to be very stable in the long term. And, because the adaptation strategies discussed above are available, there is enough "leeway" in the design that accommodating future changes should not be overly difficult.

Is the Q Keyboard too complicated?

The first time a new user encounters the Q Keyboard and this documentation, it's possible they may be a bit intimidated.

Is the Q Keyboard too complicated? The short answer is No. The long answer is that a keyboard capable of supporting hundreds of languages is not going to be a trivial device. Those capabilities need not hold you back - as long as you understand that you **do** need to read the documentation to understand its various features. If you wanted a complete understanding of every single feature of the keyboard, then **yes**, reading through all the material would take you some time. However, most people will not need every single feature.

For instance, if you don't use international currency symbols or OCR characters, there is no need to read about them. You will see that the documentation is very 'compartmentalized' or 'modular'. It is easy to skip the parts you are not interested in.

The Appendix alone takes up about 1/3 of the entire document, nearly 200 pages of it. If you don't need to reference that part of it, the remaining document is much smaller and more manageable to deal with.

In spite of all you can do with it, it is just a keyboard. You type keys, and letters appear.

Where do you start? Here are the author's recommendations, in three steps:

1. A good place is to learn how to use Live Keys. Using Live Keys, you can type the alphabets of hundreds of languages, without the need for a single Dead Key typing sequence. Live Keys are the fastest way to type accented letters and other symbols. If you want to be the most productive in typing the most non-English languages in the shortest amount of time, **learn about Live Keys**.

2. Read the Dead Key Guide for the keyboard. Just go through the entries relatively quickly at first, just to see what is there. Not every character on every Dead Key has an article that mentions it. There's too many symbols for that, so in some cases these guides may be your only source of information. Try to get a "feel" for the kinds of symbols that are present on each one. There are roughly 100 characters per Dead Key, accounting for 4 x 47 available entries and about 50% utilization of each key. Some are used more, some less. You could skim through them all in about half an hour, or read the articles thoroughly in a few hours.

3. Try skimming through the Appendix lists. Try out a FIND command in the Help viewer you use, just to see how it works.

The best way to get a handle on the Q Keyboard as a whole is to think of its capabilities in

terms of general categories, and then learn about each of them in turn. Try to visualize it:

- **Base Keys** work exactly like a U.S. QWERTY does, when AA, BB and CC are not being used. So, ***relax***. All the keys you knew before are still there, right where you left them.

- **Live Keys** are like having extra kinds of shift keys. They are the fastest way to type accented letters, so **CC E** gives you **É** and **BB C** gives you **Ç**.

- It's true that there is a large list of **Dead Keys**, so you will have to read up on them. If you ever used an international keyboard with Dead Keys before, Dead Keys on the Q Keyboard behave very similar to them. Once you learn that the colon/semicolon key is used for Diaeresis, you should be able to figure out the rest of it pretty fast. When dealing with Dead Keys, first concentrate on the primary purpose of each key. For instance, on the Diaeresis key, first learn how to type **ä** and **ü** before you learn that **÷** is also available. This subject is discussed further in How will I remember all the letters?

- ***Held Keys*** are a special kind of Dead Key, where you ***keep holding*** the **AA** modifier. This makes additional characters available that you can type, and they are no more difficult than a regular Dead Key. Held Keys are also the means used to type letters with two accents - and it lets you do so with the same number of key strokes as letters with a single accent. That's how you can type letters like the Vietnamese **ệ** with Circumflex and Dot Below easily. Again, try to learn the key combinations first that you need most. For instance, **Dead Key AL / O** is **ø** and ***Held Key AL / O*** is **ǿ** with an added Acute. You are more likely to use **ǿ** than you are **≢** or **≟** which are also on the **/** dead key.

- **Combining Modifiers** are the way you add accents to letters that don't normally have them. So, while there is no such thing as a **z** with Diaeresis, you can make one by (a) typing the **z** key, then (b) hold the **AA** key and type the colon/semicolon key **twice** - and you have your **ẓ** with Diaeresis. It's just that easy.

- Finally, **Literals** are those accent marks that stand alone, like a ˚ Ring Above accent. They are mostly used only by linguists, but they are there if you ever need them - which probably won't be very often.

  Because the Q Keyboard's Dead Key design is different from other keyboards, cases where you need to type a symbol as a Literal will happen much less frequently than is typical for conventional international keyboards. They may have some keys with Immediate Accents for adding diacritics to letters, so when you want the diacritic alone (say, a Grave Accent) you have to press Spacebar afterwards. In contrast, the Q Keyboard does not use Immediate Accents. In the case of the Grave Accent, it is on the accent/tilde key on the upper-left of the keyboard, in its normal location as a standard key on the U.S. QWERTY keyboard. You just press it like an ordinary key. Some lesser-used Literals like Breve or Tilde Below do require the Spacebar, but several common ones don't need it. This is one area where the Q Keyboard is actually **less** complicated.

This is really all there is to understanding the concepts of the Q Keyboard. That's not so bad, is it?

How will I remember all the letters?

You may be concerned that you won't remember everything. The good news is, you don't have to.

The Q Keyboard has some 2400 unique characters that you can type on it (see Q Keyboard statistics for more precise figures). Not even the ***author*** has memorized every last one of them. That is what the documentation is for.

A good way to help you remember is to look for patterns. This is discussed below.

If all else fails, you can refer to the Appendix at the end of this Help, which contains an exhaustive list of every letter and symbol on the Q Keyboard, sorted in numeric order by the Unicode value of each character, such as U+00C4 for **Ä**.

If the Appendix doesn't provide the immediate answers you need, you can use the built-in search feature of Help (in Windows) to search for what you want. When you are viewing the Appendix, you can use **Ctrl F** to Find a symbol you need, such as **`diaeresis`**. When searching the entire Help, you could use the **Search** tab if one is there. If you are reading the Help as a PDF, perhaps on a non-Windows platform, you may have similar search features available, depending on the particular PDF reader in use.

As far as the letters and symbols you use the most, you will eventually remember them. For example, if you are in an Information Technology field, working at a keyboard all day, you may type **thousands** of letters in the course of a single day - perhaps **tens of thousands** if you type a lot.

If you were typing 80-character fixed-length lines, 1,000 letter takes up just 12 ½ lines, which you could do in a matter of minutes. It doesn't take very long to "rack up" thousands of characters of typing experience.

Even if you had to write yourself a note to remember a certain letter the first few times, after you have typed it a few **thousand** times, you *will* remember the letters you really need. You can be forgiven if you forget how to type a Cyrillic Zhe Ӝ with Diaeresis. (See the description of Key W if you are curious.)

As for the rest of the keyboard's features, you can scan through the list of Live Keys and Dead Keys to find something you're looking for. Even though there are a lot of letters, there are just 24 Dead Keys. You could skim through them all in about half an hour, if all you wanted to do was find a particular symbol you needed. After you have done that a few times, you will begin to know what you are looking for, and this will go faster each time.

And, for some categories, you don't *have to* read the whole list. There are "specialty lists" that show you all the keys for things like Dual Diacritics, Math Symbols and Cyrillic letters,

so you have everything you need in one spot. Part 4 of this document contains other kinds of "targeted" lists, so that you don't always have to wade through the entire document to find something. You really ***should*** read through the entire Help at least once. After that, you will need it less and less as you get familiar with everything.

To put that character count in perspective, back in the "old days" of MS-DOS, a "green screen" monitor had 25 lines of 80 characters. That is a total of 2,000 - slightly under the total symbol inventory of the entire Q Keyboard. Yet, you could fit all them all on one low-resolution screen, or print them on a single piece of paper, with room to spare. So yes, there's a lot of characters - but not all ***that*** many. There's no need for this to be overwhelming. Don't panic - keep typing.

Most people should find that they will learn the keys needed for their particular language and applications very quickly, because the keyboard is laid out in a logical manner. Anything else, you just look up.

It's no different than a dictionary. Nobody memorizes a dictionary. You just use it to look up words as needed. Being unable to memorize every word in a dictionary doesn't stop people from buying them. Same here. You don't have to remember every character in the Q Keyboard to benefit from using it.

For instance, the Q Keyboard has a large number of math symbols. If you happen to be someone who composes technical documents, such as a scientist, engineer or university student, having those symbols available could be a big help, so you'd have an incentive to learn where they all are. If you rarely type formulas into documents, there is no great need for you to learn about those symbols.

Likewise, if you are a linguist or the author of a dictionary, you will be interested in the support provided for the IPA and other phonetic symbols, because that is what you need to get your particular job accomplished. If you're not such a person, you could skip learning about IPA support.

You wouldn't be reading this document unless there was ***something*** the keyboard offers that you needed. Just concentrate on that. Study the documentation on a "need-to-know basis". If you have the time and interest, you can always go back later and learn about other parts of it you need less frequently.

Even a little effort reviewing the documentation will pay off, giving you the ability to type things you may have previously thought couldn't be done with a keyboard alone.

The author will admit that the use of Cyrillic takes extra effort to remember. The easiest way to approach this at first is to limit your use of Cyrillic to specific letters you need for your own documents, and don't worry about all of the other ones available. As will be seen in the keys needed for Russian, many require only Key **W**, and some can be very intuitive, such as **AU W U** for the letter **Ц** which resemble a Latin **U**.

Time spent learning about these capabilities - ones literally at your fingertips - is well worth it.

Remembering by looking for patterns

All international keyboards that use Dead Keys have a built-in system for helping you remember how to use them. You combine a letter with an accent key, and both physical keys have markings (legends) which you mentally combine to come up with the final letter. The Q Keyboard also does this.

For instance, to type the letter **O** with a Slash stroke, you join **O** and **/** to get **Ø**. That is an "obvious" combination, because it's something many other keyboards do.

Here is another one. The **:** key is used for Diaeresis (remembering that this colon key gets a Quarter Turn Clockwise to become a Diaeresis), and so **O** and **:** gives **Ö**. But this key is used for many other characters, such as the divide symbol. To get that, **–** and **:** gives **÷**. The **:** and **=** gives **≔**. And the **:** and the **`~** key gives the math symbol **∺** **•**

If you look closely, you will see a lot of "**puns**" built into the definitions of several symbols. For example, on ***Held Key AL . 2*** is the **⸠double dot** symbol. Right in the sequence "**. 2**" it's telling you that it has "two dots" (actually, "dot two", and then you would reverse the words when thinking about it).

Another example is the math symbol **∴** on **Dead Key AU . /** **•** Do you notice that the symbol has three dots (".") which are rising on an ascending angle ("/") ? That's the **pun**.

Here is the math symbol **∴** that means "therefore". It has **three dots** in it. You type it as **Dead Key AL . :** **•** Do you see how the three dots in **∴** are a combination of **one** dot (".") and **two** dots (":") ? Again, that is a **pun**.

For Cyrillic letters, many puns are utilized. The letter **Й** is on **Z** and **И** is on **N**. You will see that the Cyrillic letters are forms of "**N**" or "**Z**" that have been turned or inverted, like the letter **Я** on the **R** key and the letter **Ə** on the **G** key, because when you invert **G** on the vertical axis it looks like **Ə**.

The Q Keyboard has hundreds of these puns, spanning every Dead Key. There are too many to document them all. Just look for them. By recognizing these patterns, they will be much easier to recall. Not every character could be given a good pattern or "pun" to remember them, but many have.

Is the Q Keyboard design biased?

The article below expresses the author's thoughts about the question of bias and a number of related issues. It is somewhat lengthy, and as an "editorial comment" it's not really necessary to understand the Q Keyboard itself, but it was felt important to answer those who may have had questions on this matter.

It is unlikely there is any person or human institution in existence that is not biased in some way. It is part of human nature. Thus, endeavoring to promote an international, multilingual keyboard is bound to bring up questions of bias.

It is all too clear that we live in a politically divided world. Often, languages play a role in those divisions. There seems to be an inherent unwillingness to appreciate the value of languages that are different from our own, but rather a tendency to enforce conformity at any cost. It is an unfortunate fact that disputes and intolerance over language differences have occurred throughout history. Those who have been on the receiving end of such intolerance are understandably sensitive to any perceived slights against their particular language. An outsider, even a well-intentioned one, will never fully understand the depth of those concerns, and genuine attempts to be of help can end up being viewed negatively and with suspicion. That too is understandable, and also regrettable.

It is not the author's place or purpose to take sides in these controversies, even if we accept that some persons and groups have had valid and justifiable grievances in this regard. The facilities of this keyboard are freely available to anyone that wishes to utilize its technology. Every effort has been made to remain **neutral** to issues of politics. For the record, there is no political agenda behind the Q Keyboard, and none should be inferred.

Still, the question of bias deserves to be answered.

In one respect, there is certainly a "bias" towards using Latin letters. In the author's view, it would be utterly impossible to devise a **usable** "universal keyboard" that typed every conceivable alphabet of every language in existence - at least not an actual, physical device.

> If someone were audacious enough to succeed in making such a thing, it would most likely be stunningly complex. The average typist wouldn't understand how to use it, its software would not fit into the constraints of conventional device driver protocols, and it would be very expensive. Aside from these technical issues, no individual keyboard designer is likely to have the expertise to do justice to all the languages represented by every existing alphabet and script. (And, if this device were too complex for one person to *design* alone, how could any individual person *understand* it alone?) It would end being up a massive compromise that pleased no one. Within the limits of existing technology, it simply can't be done, and you wouldn't want to use it even if it could be

done.

It is likewise impossible to create a keyboard that "optimizes" or "assists" typing for any particular group of users in a way that did not create a "bias" towards that group - and thus a corresponding bias *against* some other group.

So, for those wishing a short answer to the bias question: If you looked hard enough, could you possibly find any aspect of the Q Keyboard that even remotely reflected any sort of bias whatsoever? Yes, without question. **There are also similar biases in every keyboard that ever existed - past or present**. The more important question is not so much whether any biases are to be found at all, no matter how slight, but whether those biases result in unacceptable design shortcomings, or if those biases stem from bad motives, and whether the advantages of the Q Keyboard (or any other) outweigh those perceived biases. Each person must judge for themselves.

Having a "bias" towards Latin letters should by no means be taken to suggest that other, non-Latin alphabets are in any way "inferior". The Unicode standard defines many non-Latin alphabets, perhaps the most prominent of which is Arabic. If the Q Keyboard can support Greek and Cyrillic, why not Arabic? For that matter, why not all the other alphabets too? The short answer is, they won't fit in the available memory of the keyboard software.

Further, any additional non-Latin alphabets, if supported, would be accessible only as Dead Key characters. Persons who constantly used such non-Latin alphabets for their native language (say, Arabic, if it were available) would be subjected to **much** greater typing effort than a native keyboard would impose on them. Extended use of the keyboard under those circumstances would be tiring and unpleasant. The Q Keyboard already has a disclaimer that its support for Greek and Cyrillic is **not** intended as a replacement for native keyboards, but only for short passages.

But more importantly, the author does not understand these other alphabets, and because of that, it would not be possible to give due justice to all the requirements and subtleties of each language. For instance, French composition favors the use of non-breaking spaces adjacent to **Guillemet « »** quotes, and other European languages use **Em Dash** and **En Dash** followed by a non-breaking space to introduce quotations; these requirements have been accounted for. But languages like Arabic are far different than Latin-based ones, and those differences go beyond simply being a right-to-left alphabet with letter forms that vary based on the position within a word. Without having real first-hand knowledge, there is no way an outsider could properly account for each alphabet's language-specific nuances and subtleties. Trying to include support for such scripts in spite of that, without having the necessary grounding in the semantics of each language, would lead to an inferior and unsatisfactory design.

With that understanding, and within the limits of the languages that the keyboard (and the author) are capable of supporting, we assert in all sincerity that there are no **intentional** biases either for or against the accented letters, legacy keyboard designs or

usage of any language, group, region or nation over any other, and we further assert to be an honest broker, objectively considering the needs of all candidate languages as various design issues arose. The resulting keyboard design, though not necessarily 'perfect' or appropriate for everyone, should be helpful to many people. We can't do everything - but every effort was made to be the best at what this project sets out to do. And, should any **unintentional** biases be discerned, rest assured that they stem not from bad motives, but from the ordinary limitations that constrain any mere mortal.

We must remember that alphabets, like languages themselves, serve a purpose. There is an advantage to supporting Latin, since so many languages use it. To make an analogy, there are advantages to speaking English, since it is widely used, there are large amounts of literature written in it, it is the primary language of the Internet, and so on. Are those advantages so great that someone would give up their native language in favor of English? For some, the answer is Yes and for others it is No. Likewise, is the Latin alphabet so useful that some would give up their native non-Latin alphabet in favor of it? Some would say Yes and others No. (Some have said **both** - more than once.) The Latin alphabet has existed in various forms for 2,500 years, and is not going away. Whether that is seen as sufficient reason for any language group to change their native alphabet to Latin is totally up to them. There are non-Latin alphabets that have beautiful, well-designed glyphs that are not in any way inferior to Latin. All we can say is that, within the constraints of what the Q Keyboard is reasonably capable of doing properly, they simply cannot be included.

Having said all that, it is freely admitted that the author is a user of the U.S. QWERTY layout. The premise of this project is that world-wide familiarity with the U.S. QWERTY as a starting point will genuinely serve the best interests of the Q Keyboard's international user community. Readers are free to judge for themselves whether that premise is valid, or if it demonstrates bias. (And, if it *is* a bias, whether it is an acceptable one.)

> Even supposing it *were* seen as a bias (and one in need of correction), the Q Keyboard design is so integrally intertwined with the U.S. QWERTY that it cannot easily be extricated from it. The design is committed to the current approach. However, because the Q Keyboard design stipulates allowance for QWERTZ and AZERTY **variants**, that could help mitigate some objections of this sort. See the article Regional Layout Variants for more information on this topic.
>
> Doubtless, some may object to the U.S. QWERTY for the very reason that it originated in the U.S. and because their objections are, to some extent, political. Some who look at the list of letters and languages supported might be tempted to assume that it implies a tacit approval of the political entities that use those languages, or that by not supporting other languages it implies a corresponding disapproval. Some might take offense, or question the author's motives, if the language of a political entity they disapprove of is supported, or if one they do approve of is not supported. It would be incorrect to draw such conclusions. There are no hidden agendas or secret motives. It is not the author's place to pass judgment on any political entity, either for good or bad. The *only* motive is to provide the most useful international keyboard possible, given the technical and practical constraints inherent in creating such a thing, and with the

understanding that we cannot do everything. As far as which **Latin** letters are supported, every letter that seemed even remotely useful was included if at all possible, *without regard* to which nations, peoples or languages used them.

It is understandable and not unexpected that objections to the Q Keyboard's design might arise in our very divided world, and there is not much the author can do to overcome them, other than to reiterate that there is no political agenda behind this project. Potential users are asked to evaluate this keyboard solely on the merits of its design.

For any that might object to using the U.S. QWERTY as the starting point, the problem then becomes, what **do** we start with?

• QWERTZ is a common alternative in Europe, but is barely different than QWERTY. Aside from swapping Y and Z and changing the right-hand side a little, it's still QWERTY with all that entails. For German speakers, at least there is a sound rationale for them to swap these two keys, based on the frequency of the letters T and Z - both when used separately and together.

• AZERTY is little used outside of France. By swapping the A and Q keys, it requires greater effort to reach letter A (which is present in over 8% of all French words), while it makes letter Q *easier* to type, even though Q is present only one-tenth as often as letter A. That design choice is hard to justify, and it goes contrary to ergonomic principles. Yet, French users are reluctant to give this up. And, such criticism doesn't even begin to address other issues that presently make AZERTY inadequate for the needs of French typists. Because AZERTY requires the numeric row for certain accented letters, typing of digits requires Shift, making it harder to use the keyboard for arithmetic and financial purposes. Users can mitigate some of these problems by using a keyboard with a Shift Lock instead of a Caps Lock or one with a separate numeric keypad, but those options are not always available. (Curiously, by swapping A and Q, the row seeing the highest usage is the AZERTY row **itself**, which now has all the vowel letters - thus effectively *relocating the de facto "home" position* from the middle letter row to the upper letter row. When viewed that way and allowing for such a non-typical "home" location, AZERTY may be somewhat more ergonomic than we might assume at first glance.) Because the distribution of punctuation symbols on AZERTY is very different than the QWERTY, it makes adaptation of the Q Keyboard design to AZERTY difficult. In particular, there is no easy way to implement the Q Keyboard's Dead Key system (including the use of Early Shift) in the same general way on an AZERTY device.

• BÉPO is an alternate layout for French, and was not really intended for other languages. Its design reflects the letter frequency of French, which might or might not appeal to speakers of other languages.

• The Belgian Linux layout is the French AZERTY with a number of extra characters scattered around the keyboard, with seemingly little rationale. In fact, it is a minor alteration of the ISO keyboard standard for an “outdated common secondary group”

that was defined in an early edition of ISO/IEC 9995-3:2002, as applied to the AZERTY layout. (A discussion and diagram of that layout can be found on Wikipedia.) For French speakers wanting the most capabilities with the least change from what they have, this could be a good choice. However, the Belgian Linux keyboard has many of the same shortcomings as AZERTY and would likewise have limited appeal for non-French speakers. For instance, even with all its added characters, you must still use Dead Keys to type **É È Ç À** and **Ù**, and a Dead Key is also needed for both **ê** and **Ê** as is required on standard AZERTY. Thus, many improvements that could have been made were not addressed.

• DVORAK was originated to optimize the typing of English, and while its concepts been adapted to a few other languages (such as BÉPO, which is said to have been inspired by DVORAK), it has never received wide support. Because DVORAK is a simple, one-for-one rearrangement of QWERTY keys, it would not be impossible to devise a Q Keyboard ***variant*** using the DVORAK layout. However, the current strategy of locating extra letters on the Southwest Vowels and Northwest Vowels would no longer work as well as it does now. For that reason, there are presently no plans to support a DVORAK Q Keyboard variant. (It could be considered in the future, should there be sufficient user demand.)

• The Canadian Multilingual keyboard tries to merge QWERTY, AZERTY and Belgian Linux concepts in an attempt to please everyone. And, like so many projects designed by a committee, it seems to please no one. Criticisms by those dissatisfied with this keyboard are easily found. Some of its shortcomings include an incomplete set of Dead Key diacritics, prominent support for deprecated letters, symbols of limited usefulness, and a Turkish Small Dotless `I` that requires Ctrl+Shift but a corresponding Capital `I` with Dot Above that must (inconsistently) be typed as a Dead Key.

• The Neo keyboard, targeted to German users, is an innovative and creative design, but one that is likely to bewilder people with its complexity and lack of similarity to any other keyboard.

Efforts to completely redesign keyboards using scientific methods as employed by ergonomics researchers are commendable, but they will be unable to avoid the same consequences as BÉPO, DVORAK and Neo: A keyboard that no one ever saw before and few would understand. What is more, Aalto University in Finland found that typists don't even need all ten fingers to type effectively, throwing into question the fundamental rationale behind ergonomics. If people can type with relatively good efficiency on existing layouts **using just six fingers** and self-taught techniques, how will rearranging the keys to adhere to some novel but theoretical model - one that was never seen before and never field-tested in the real world - be any better?

For more information, see http://www.aalto.fi/en/current/news/2016-02-09/.

We might object to QWERTY - even for plausible reasons - but there just are not that many practical alternatives.

For many people, the ergonomic issues being pursued by researchers are irrelevant. Users by and large do not **want** ergonomic keyboards. (If there were a real demand for such devices, they would sell well - but they don't.) They don't really want their keyboards changed at all. Users want QWERTY keyboards (or their local keyboard), because that is what they are familiar with. When they are presented with a typical ergonomic design, their usual reaction is (a) "it's weird" and (b) they won't use it.

Those who design ergonomic keyboards are well-intentioned, but they miss an important point: The very act of typing keys of any sort is stressful. As a physical activity, typing is hard to do and is hard on our hands. Merely rearranging the layout of those keys will not take that stress away, even though it might alter the patterns of stress very slightly. When keyboard designers have tried to conduct research as to whether a particular ergonomic design was an improvement or not, the results have generally been inconclusive and often controversial, with changes in observed productivity rarely varying from slight improvement to slight impairment. No matter what layout is present, people are basically going to use every finger to type every key, in one way or another. Further, keyboard ergonomic studies seem to ignore the holistic effects and interaction of a mouse or pointing device along with the keyboard. Mouse usage has ergonomic impacts as well, and they are unaffected by any modifications to the keyboard. Changing a keyboard layout may introduce slight differences, but will not alter these fundamental facts.

At times, proponents of various designs have accused those opposed to them of being biased and having vested interests or hidden agendas. These arguments and the resulting discord have left the public unconvinced of the merits of non-QWERTY layouts - perhaps justifiably so, perhaps not. Either way, the history on this subject suggests that the window of opportunity to dramatically diverge from QWERTY has closed. Outside of a few technically-minded individuals who like to experiment with such things, it is unlikely that non-QWERTY designs will ever succeed in any significant way. (AZERTY and QWERTZ are seen as minor variations of QWERTY, which do not meaningfully diverge from the concepts of the QWERTY standard.)

The author believes that greater ergonomic gains will be realized through improvements in the physical design and manufacture of keyboards, by making keys quieter, by making key motions smoother, by requiring less force to type, and by reducing key vibrations and bouncing effects that transmit stress-inducing shock motions up from the keys to the typists' fingers.

The author, while being from the U.S., has no relationships or affiliations with any individuals or organizations outside of North America. He is not beholden to any nation, region or interest group that is promoting any one language over another. In addition, while the author has an abiding interest in languages in general, he is not a speaker of any language other than English, and so has no personal stake in favoring one over another.

The basic premise of the Q Keyboard is that it is a pure extension of U.S. QWERTY. If the

various Q Keyboard enhancements are not being used, it works exactly the same as a U.S. QWERTY keyboard. Thus, anywhere in the world that the Q Keyboard is present, anyone familiar with the U.S. QWERTY could use that part of the keyboard and immediately know how to operate it and be productive.

Is using the U.S. QWERTY really a sound decision, and not merely a bias on the part of the author? Consider the following:

- Many **Information Technology** applications in common use world-wide, such as email, the Internet and computer programming, had their origins in the U.S. That observation is not brought up here as if to boast in some nationalistic way, but is simply a fact. Because these computer technologies were designed to use special characters like **[ ] { } $ #** and **@** that were readily available on the U.S. QWERTY keyboard when these software systems were devised, it makes that layout well-suited for such IT tasks. (The Q Keyboard contains additional characters that may also be useful for such tasks, such as **¬ ¢ ¦ ≠** and others. See Math Symbol Live Key Guide and Math Symbol Dead Key Guide for more information.)

- The **symmetrical placement of the bracket/brace keys** on a U.S. QWERTY keyboard allows us to easily map them to international "word processing" quote characters in a logical and consistent way. That would not be possible on AZERTY and QWERTZ layouts, which tend to locate their quotation marks somewhat haphazardly.

- Likewise, the standard, **symmetrical locations of < and > keys** on the U.S. QWERTY are an ideal place to locate the *Guillemet* quotation marks **«** and **»** used in French and other languages, both because of the key symmetry and the similarity in the shapes of the **< >** symbols to the **« »** quotes. In contrast, many non-English keyboards use an "OEM 102" key to the left of the Z key for both the < and > symbols, where one of these requires a Shift and one does not. If the Guillemet quotes were assigned there, the open **«** quote and the close » quote would use the Shift differently, so that typing these symbols would be inconsistent and thus more difficult.

- The keys for **Enter, Shift and Backspace** are generally larger and easier to use on U.S. QWERTY than on other keyboards.

We may properly ask, could any regional keyboard - having specific, dedicated keys for their own locally favored accented letters of one sort or another - be presented to the world as a ***more* unbiased** design choice than the U.S. QWERTY? Would a French AZERTY or German QWERTZ design receive greater world-wide acceptance as the basis of a universal international keyboard layout? It is the very fact that the U.S. QWERTY has no accented letters of its own that makes it *neutral* to international language and region differences. By using it, no group is being specifically favored or disfavored.

The U.S. QWERTY is known and used all over the world, side by side with keyboards of many nations. Oftentimes, regional keyboards have been copied very closely from the U.S. QWERTY, being just slightly modified for local needs. No other keyboard would have the

same international recognition that typists world-wide have acquired by using the U.S. QWERTY layout, even with the familiarity they may have in using their own local keyboards. Learning to use it does not demand that everyone "start over from scratch" the way that BÉPO or DVORAK or Neo does.

So, does the Q Keyboard represent a "U.S. bias" or a "U.S. agenda"? Hopefully, the reader would agree it does not.

If there is any bias in play here, it's mostly that the author is biased towards being *lazy* (so to speak).

That is, at each point in the design process, certain questions were asked over and over:

- Is this layout easy to use?
- Will people understand it?
- Does the design make sense?
- Will the chosen key positions be seen as fair and reasonable to most typists?
- Are the character assignments for one key consistent with other keys used for similar purposes, when achieving that consistency is possible, and would not itself cause other problems if pursued?
- Are the most people getting the most benefit from the particular design choices being made?
- Are any features being added in the name of "ease of use" that seem to favor one group over another, if the keyboard's resources could just as well be applied to other competing purposes?
- How can the design be simplified, to reduce effort or ease understanding?

And, perhaps most important:

- If I were forced to use my own keyboard design every day, would I like it or dislike it?

The "laziness bias" requires us to ask at each point: What design choices would demand the absolute *least* amount of effort from typists to get the same results typing the same characters? What key sequences are the easiest to *learn*, the easiest to *remember*, the easiest to *use*? And so on.

Keyboard designs necessarily involve compromises, because there are always too many letters and not enough keys. We can't do everything, and choices have to be made. Every choice made is also a 'lost opportunity' to choose some alternative. (Just as we could place the steering wheel of an automobile on the left side or the right side, but not both.)

The author has impartially considered the needs of as many languages and regions as possible before settling on design choices. Every key sequence for every letter and symbol has been tested. For some, that was done dozens or hundreds of times, and for some it was thousands of times. The author *has* used his own keyboard. Any proposed feature that seemed awkward, or too much work, or too hard to remember was changed until it

was as smooth and easy to use as possible. This does not mean we claim the Q Keyboard has achieved a 'state of perfection', but the same kinds of questions and issues that any good typist would consider *have* been considered - over and over, during the design process - and were taken very seriously.

It should be remembered that this is an *international* keyboard, not one intended solely for the benefit of any one particular nation or region. The thought is that everyone is going to be typing every letter from the languages of every nation, eventually. *All potential uses* of the keyboard need to be fair, because persons involved in international communications will be using many kinds of letters, not just the ones for the language they speak. German typists may use tilde accents, French typists might use caron accents, Spanish typists may use the double acute letters of Hungarian, and who knows about ogonek letters? The **one** design has to work for everyone.

Having said that, users will find that French, German, Spanish and Scandinavian languages are very well supported. Many others are also well-supported, though some may require slightly more effort to use. The Q Keyboard's support of **Live Keys** makes many accented letters as easy to type as dedicated, native accent keys. The article Live Key Conformant languages shows the many languages that can be typed this way.

In order to make possible the most benefit to the most people, the larger language groups have to be considered first. That is only fair. Thus, for instance, letters with acute and grave accents and the diaeresis (also called umlaut or trema) are very easy to type, while letters with macron and tilde forms require slightly more effort to produce, because they are used by fewer people. Is it fair and unbiased that speakers of Spanish (numbering some 570,000,000 people) can type their alphabet very easily, while speakers of some indigenous language having a complex script but only 100 or 1,000 speakers might have to use Dead Keys, which take more effort? The only possible answer is, *it has to be this way*. All users of the Q Keyboard are free to make their own judgments about this issue.

The Q Keyboard can be used to type languages that are Romanizations of Cyrillic scripts, which require some additional special letters to complete. (Some of these languages still retain a few Cyrillic or Cyrillic-like letters.) Getting to those additional letters will require a Dead Key or Held Key sequence, so there is a corresponding additional effort needed. The keyboard's selection of Cyrillic is large enough that it is possible to type a language such as Russian that consists entirely of Cyrillic letters, instead of just a few here and there. However, doing so means typing a Dead Key or Held Key for every single letter. Because that would be time-consuming and take more effort than typing a more conventional Latin language, you would normally only do this for short passages, proper names, geographic locations, and so on. That consequence is consistent with the primary design goal of the Q Keyboard, which is to enable typing of **Latin** letters, rather than those of other scripts.

These design choices are not biases. They just reflect the reality that decisions and compromises are required to associate a multitude of letters to a finite number of keys and get it all to work in a coherent and consistent way.

Part 2: User Guide

This section of the user guide provides descriptions and explanations of most of the fundamental Q Keyboard features.

Summary of features

The Q Keyboard supports the following features:

- Base Keys for entering conventional U.S. QWERTY letters
- Unique modifier keys known as AA, BB and CC used instead of **AltGr**
- Live Keys for quickly entering accented letters and symbols without the need for Dead Keys
- Conventional Dead Key entry of symbols beyond the basic keyboard, with enhancements
- Held Keys, similar to Dead Keys, for additional or lesser-used symbols and dual-diacritic letters
- Support for Greek, Cyrillic and Vietnamese alphabets
- Special letters used in African languages like **Ɓ Ɗ ɔ Ɛ ƙ ɱ ɲ ɣ** ʷ **Ƴ**
- Seldom-used and archaic letters like **ə ȝ ǯ þ ƿ** ʒ ꞎ ꞅ ⅦⅦ ꝿ
- Superscript and subscript characters for numerics and selected alphabetic forms
- Small capitals
- A comprehensive set of fraction symbols, with a composable fraction capability
- A large collection of Math symbols, as Live Keys and Dead Keys
- Phonetic symbols used in IPA and APN notational systems
- Upper-case and lower-case modifier letters present in some languages, and used by linguists
- Box-drawing characters, for both single-line and double-line boxes, and several arrow symbols
- An extensive set of currency symbols covering all major denominations world-wide
- Commonly used currency symbols **¢ £ € ¤ ¥ ₩ ₫ ₹ ₽** that can be quickly typed as Live Keys
- Easy-to-use combining diacritic marks
- A wide range of special-purpose spacing, joining and hyphen/dash symbols, and pronunciation marks
- Chess and Checkers (Draughts) like ♛ and ⛁ and playing-card symbols like ♣ as described here
- Apothecary symbols ℞ ℈ ℥ ♏ ♍ ℔
- Preliminary support for Bidirectional text
- All symbols present on the Belgian Linux AZERTY, German T2 QWERTZ and Canadian Multilingual and proposed AFNOR French keyboards are available, nearly all without the use of Dead Keys *. See Part 5: Language and Keyboard Guides for more information on this topic.

These are the major features of the Q Keyboard. Review the full documentation to see all available capabilities.

* A small number of symbols (perhaps two or three) that might be directly produceable on some international keyboards, such as **'n Preceded by Apostrophe**, are only available as Dead Key or Held Key letters. This was done because such letters are

deprecated or rarely used, and the Live Key keyboard space is better utilized for other purposes. The Q Keyboard supports Letter ’n Preceded by Apostrophe, even though it is deprecated in Unicode, for sake of completeness and because it remains present in the Windows WGL4 character list.

You should find that the currently supported layout is intuitive and easily learned.

See Key 2A and Key 37 for ways to type the **’n** letter. See French, Italian and regional languages for a discussion of the AFNOR French AZERTY.

Base keys

The Q Keyboard supports all standard **Base Keys** for entering conventional U.S. QWERTY letters.

When the extended features of the Q Keyboard are not being used, the base keys work exactly the same as a conventional U.S. QWERTY keyboard. That is important when performing Information Technology tasks such as email, Internet access and computer programming, which often depend on the special characters present on the U.S. QWERTY. Users familiar with the U.S. QWERTY layout can use the Q Keyboard right away and be productive immediately.

The Q Keyboard takes the **left** (or only) **Windows Logo** key as the **BB** modifier, as well as the **left Alt** and **left Ctrl** for **AA** and **CC** respectively. For keyboards having only one Windows Logo, there are means to reassign a seldom-used key as an alternative **Logo**, if needed. (Depending on your keyboard layout and keying practices, having an alternative location for **Logo** may not be important to you. Many Windows users rarely if ever use the Logo key.)

Most users should not encounter difficulties with this.

If you need to swap layouts, use the mouse to change keyboard layouts in the Windows Language Bar. In Windows 10, you can also use the reserved key sequence of Windows Logo + Spacebar to change layouts.

When the QWERTZ or AZERTY **variants** of the Q Keyboard are used, some of the base keys are repositioned (that is, remapped) to achieve **partial compatibility** with traditional German or French keyboard layouts. This partial compatibility affects the **Q W A Z** and **Y** keys only.

The consequence of this partial compatibility is that the left half of the keyboard can conform to either QWERTY, QWERTZ or AZERTY, but the right half will always conform to QWERTY.

Modifier keys AA, BB and CC

Note: Refer to Modifier key visual display to relate Modifier key notation to the keys being pressed.

Conventional international keyboards use an **AltGr** key, and sometimes a specially-configured **Ctrl** key, to produce additional letters. (A special Ctrl key is notably used in the Canadian Multilingual keyboard.) **AltGr** stands for Alternate Graphic, and can be pronounced as "Alt Graph". **AltGr** is a "shortcut" key, which is treated by Windows as if a standard **Alt** key and a **Ctrl** key were being pressed at the same time.

The Q Keyboard works differently. It does not use **AltGr** or a special **Ctrl** key to select letters. Instead, it defines three new modifier keys, known as **AA**, **BB** and **CC**.

Operation of new modifier keys on hardware-defined keyboards

The Q Keyboard design can be adapted to devices having physical AA, BB and CC modifier keys. These modifier keys would be assigned to normally-unused keyboard scan codes that do not conflict with standard U.S. QWERTY usage. A separate document for hardware vendors explains this in more detail.

The remainder of this document describes such a physical Q Keyboard device as a hardware-defined keyboard in contrast to a standard U.S. QWERTY keyboard running with the device driver software alone, which is termed a *software-defined keyboard*. Note that both types of keyboards require a device driver, though they are configured somewhat differently.

Such a device would not "remap" or "repurpose" any existing Alt, Windows Logo, Ctrl or Windows Application keys.

All discussions appearing in this document about "repurposing of keys" apply **only** to a software-defined keyboard.

Hardware-defined keyboards do not as yet exist.

> Hardware-defined keyboards would support the QWERTY, AZERTY and QWERTZ **variants** by a physical hardware switch, or by a reserved FN key sequence, instead of using software. See the article Regional Layout Variants for more information on this topic.

Operation of new modifier keys on software-defined keyboards

The software-defined Q Keyboard, as a device driver, alters the behavior of a standard U.S. QWERTY keyboard, which does not have an **AltGr** key. Thus, the Q Keyboard does not have an **AltGr** either. Because the **AA** modifier key remaps one of the **Alt** keys, there must be another **Alt** key available for use in its normal role.

The Q Keyboard software is not supported on devices having only one **Alt** key or one **Ctrl** Key, nor on non-U.S. QWERTY devices. It is possible that a keyboard with one **Alt** key and one **AltGr** key might work, but it may have other issues that made using it difficult, such as having key cap legends that differed from the Q Keyboard's understanding of standard U.S. QWERTY key assignments.

Because there are three modifiers instead of one, and because these modifiers work independently of the existing **Alt** and **Ctrl** keys, many more "modifier combinations" or "shift states" are available. This makes possible a much larger set of letters that can be directly typed than is possible with an **AltGr** key alone. The total number of key combinations (without taking Dead Keys into account) is 611, not including the Spacebar.

The number 611 comes from 47 keys x 13 modifier levels. This total includes the standard keys of the U.S. QWERTY, which comprise 47 keys x 2 Shift states, for a total of 94 standard letters and symbols. There are thus 517 key combinations added using Live Keys. 77 of those 517 key combinations are *composed digraphs and trigraphs* instead of discrete letters. For example, you can type the letter **ṅ** with Diaeresis as a Live Key Digraph, using **ABC :** as a Hyper Key. Digraphs and trigraphs are used to automate the typing of letters requiring composition when they don't exist in Unicode directly. Because there are 24 Dead Key (diacritic) keys, and each has a normal mode and Shift mode, there are 48 key combinations taken up for them. See the article Q Keyboard statistics for more information.

When you *directly type* a letter using one of the modifier keys **AA**, **BB** or **CC**, we say you are typing with a Live Key.

Note that the **AA** modifier is used for **both** Live Keys and Dead/Held Keys. For the "final" key, it is either a Live Key or a Dead/Held Key when **AA** or **AA+**Shift is held. For any given final key, **AA** is only used one way. For instance, **AA+**Shift **L** produces the Capital **Ł** with Slash Stroke as a **Live Key**. **AA : o** produces **ö** as a **Dead Key**, and **ȫ** as a ***Held Key***. Here, **AA** plus the **:** colon always starts a Dead Key or Held Key sequence; it is never used as a Live Key.

The key in question here is the one with both **colon** and **semicolon**. On the Q Keyboard, Dead Key accents always refer to the ***key*** being used, not the symbol ***on*** the key. So, it really doesn't matter if we call this the "colon" key or the "semicolon" key; it's the same physical key. (It's "the same hunk of plastic" if you wish.)

The behavior of the **AA** modifier is similar to how an **AltGr** key works on some other

keyboards, which may use it both for conventional Dead Keys and for what we describe as "Live Keys".

On a software-defined keyboard, these new modifier keys are repurposed ("remapped") from existing keys, those being **Alt**, **Windows Logo** and **Ctrl**.

Software-defined Q Keyboard modifiers are **not** the same as the keys they replace

As long as a Q Keyboard device driver is in active use, a key that has been repurposed as a Q Keyboard modifier no longer functions as the original key. So, if you press a repurposed Windows Logo key that is now **BB**, the usual Windows Start Menu popup will not appear. And, when a **Ctrl** key becomes a **CC** modifier, that key is no longer a **Ctrl** key**.** We do not refer to a letter like **á with Acute accent** as being produced with **Ctrl A**. It is produced with **CC A**. The same can be said regarding the **AA** and **BB** modifiers. This is important to remember.

For instance, a common task in Windows is to copy highlighted text using **Ctrl C**. If you attempt to do this when that particular **Ctrl** key is enabled as the Q Keyboard **CC** modifier, you will **not** copy the highlighted text. Instead, what will happen is that all of your highlighted text will be **deleted** and replaced by the letter **ć with Acute**, because that is what **CC C** produces. **CC C** is not the same as **Ctrl C**. Likewise, **CC B** is not the same as **Ctrl B**, so if you attempt to **bold** some text by using **CC B**, you will delete that text and replace it with the letter **ń with Acute** instead.

If you make this mistake, most editors have an Undo feature activated by **Ctrl Z**, to restore the text you inadvertently deleted. However, you must be sure to use the **correct** Ctrl Z. Or, you can swap your keyboard (to a version such as the standard U.S. QWERTY) so that the **Ctrl** key you need to use is available, or else you can use the mouse to select an "undo icon" in your application. Otherwise, attempting to issue a **Ctrl Z** to "undo" your mistake by using that same **CC** modifier will just activate **CC Z** and produce a letter **ź with Acute** instead, further compounding the problem.

With practice, you will learn to avoid these kinds of mistakes. As you begin using your Q Keyboard in new ways, you will create new typing habits and new "finger memory", and such keying errors will occur less and less often.

Modifier key visual display

For a more in-depth discussion of this topic, see Modifier Keys AA, BB and CC.

To help you *visualize* how your keyboard's **Alt**, **Windows Logo** (**Win** ⌘) and **Ctrl** keys are used as Q Keyboard **Modifiers**, the following diagrams make the connection between these **keys** and the Modifier **notation** used throughout the Help document.

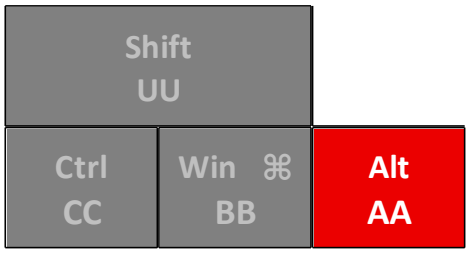
When a modifier like **AA** does **not** use Shift, the alternative name like **AL** is used as a reminder that the intent of the modifier is primarily for **Lower** case letters.

When a modifier like **AA** *does* use Shift, the alternative name like **AU** is used as a reminder that the intent of the modifier is primarily for **Upper** case letters.

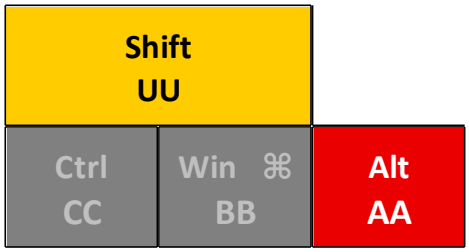
As shown below, the same terminology also applies to **BB** and **CC**.

This convention of using **U** for **Upper** case is suggested by showing the **Shift** with an added label of **UU**.

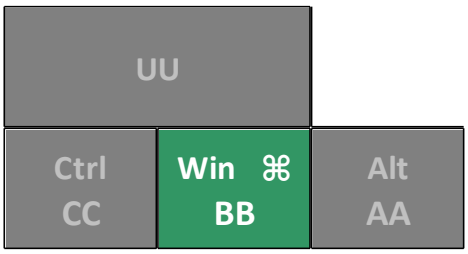
Modifier **AA** without **Shift**, also known as **AL**:



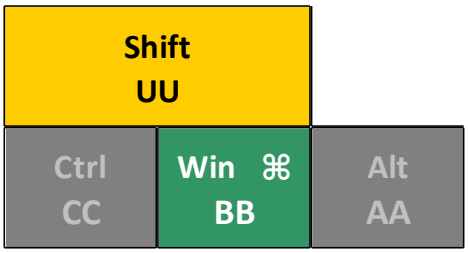
Modifier **AA** + **Shift** (**AA** + **UU**), also known as **AU**:



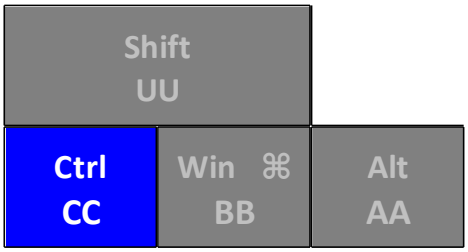
Modifier **BB** without **Shift**, also known as **BL**:



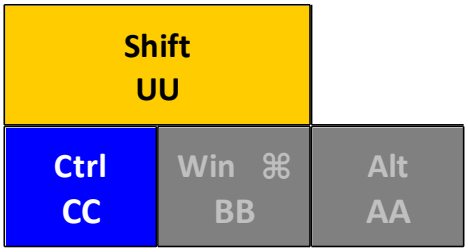
Modifier **BB** + **Shift** (**BB** + **UU**), also known as **BU**:



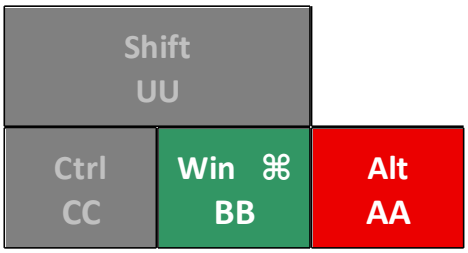
Modifier **CC** without **Shift**, also known as **CL**:



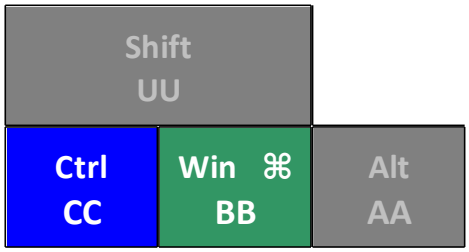
Modifier **CC** + **Shift** (**CC** + **UU**), also known as **CU**:



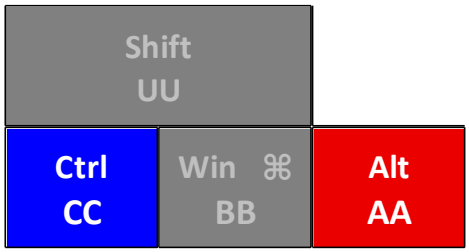
Modifier **AA** + **BB**, also known as **AB**:



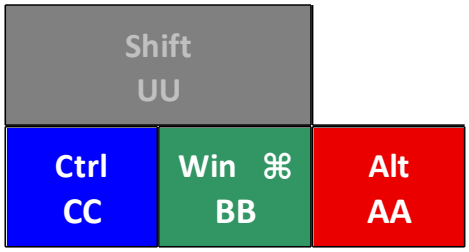
Modifier **BB** + **CC**, also known as **BC**:



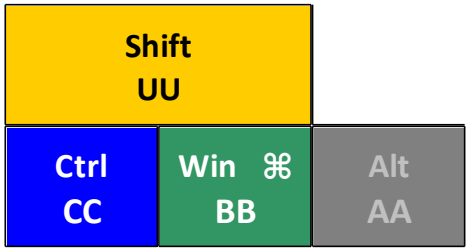
Modifier **AA** + **CC**, also known as **AC**:



Modifier **AA** + **BB** + **CC**, also known as **ABC**; this is a **Hyper Key** modifier:



Modifier **BB** + **CC** + **Shift** (**BB** + **CC** + **UU**), also known as **BCU**
This is a **Hyper Key** (or, **Hyper Shift**) modifier:



Using the new modifiers

To operate the software-defined Q Keyboard, three standard modifier keys are taken and repurposed to become the new **AA**, **BB** and **CC** modifiers.

> This section does not apply to a hardware-defined Q Keyboard, which has dedicated physical modifier keys AA, BB and CC, and does not take away any standard modifier keys. Hardware-defined keyboards do not as yet exist.

The Q Keyboard maps the **left-hand** Alt, Windows Logo and Ctrl keys for the unique AA, BB and CC modifiers.

> Earlier Q Keyboard designs also allowed for the **right-hand** Alt, Windows Logo and Ctrl keys for these modifiers. Those additional possible layout designs have been dropped for now. Recent keyboards from hardware manufacturers now commonly diverge from the "classic" IBM PC/AT layout. It is now not unusual to see "full size" keyboards that lack a right Windows Logo key, for instance. This makes a right-hand layout more difficult to implement. Even for classic layouts, the standard four modifier keys on the right can be harder to use than the three on the left-hand side. In addition, having many alternative keyboard layouts would have been confusing to the end user. The current approach greatly reduces the number of possible layouts.

As mentioned previously, the Q Keyboard, as a device driver, alters the behavior of a standard U.S. QWERTY keyboard, which does not have an **AltGr** key, so the Q Keyboard does not have one either. Because the **AA** modifier key remaps the left **Alt** key, there must another **Alt** key available for use in its normal role.

> If you have a laptop computer with a compact keyboard which has only one **Alt** key, or only one **Ctrl** key, you will not be able to operate the Q Keyboard device driver on such a machine, unless you attach an external U.S. QWERTY keyboard. The external keyboard can be a wired or wireless device, as long as it is fully compatible with the U.S. QWERTY and has all of the necessary keys.
>
> See A note about keyboard compatibility for more information.

Many laptop computers have a key labeled **FN**, used to make additional vendor-specific keyboard functions available. The location of the **FN** key varies between one laptop model and another; it is often on the left side near the Ctrl key, but may be on the right side or even on top near the numeric row. Like other Windows keyboard device drivers, the Q Keyboard software is unable to remap an **FN** key or even detect that one exists. The **FN** key plays no direct role in the Q Keyboard's design or functionality, except where it is used to select other conventional keys that the software does recognize.

Q Keyboard modifiers

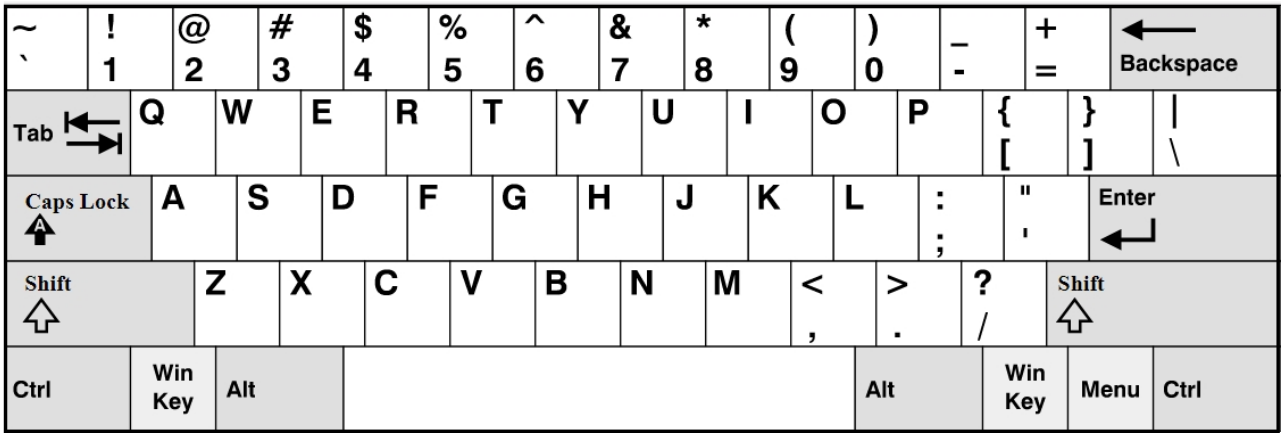
Q Keyboard modifiers are assigned as follows:

- The left **Ctrl** key becomes the **CC** modifier
- The left Windows **Logo** key (having a flag-like symbol) becomes the **BB** modifier
- The left **Alt** key becomes the **AA** modifier

When discussing the original keys that the **AA**, **BB** and **CC** modifiers are taken from, "Alt key" and "Ctrl key" are concise terms, but "Windows Logo key" is not. It may be convenient to refer to this as the "Flag key", since the icon usually present on this key resembles a flag.

> Note: This documentation refers to the Windows Logo key as "Logo" for short. You may encounter other documentation that refers to this as the "Win" key. These are two names for the same thing, being the key with the flag-like icon on it.

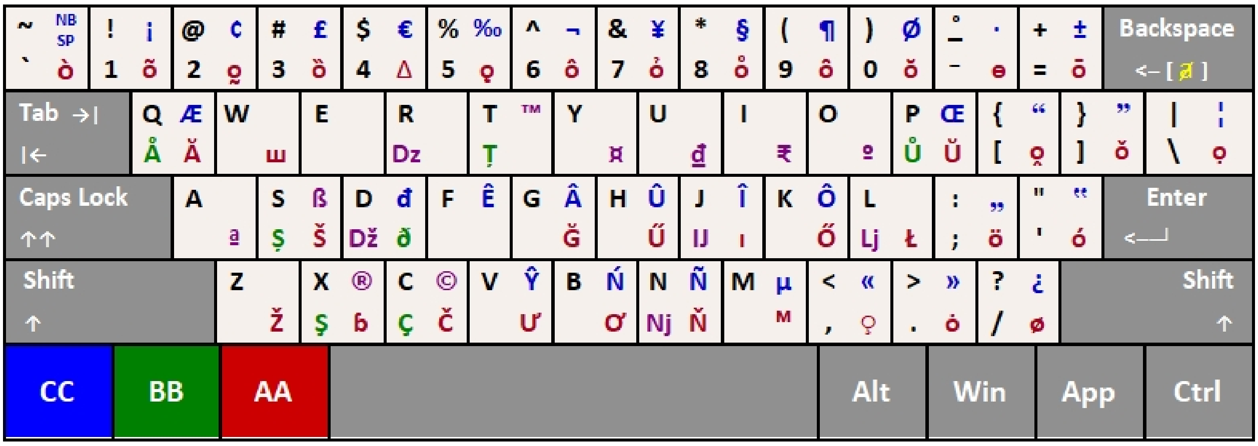
A "standard" U.S. QWERTY keyboard is expected to look like this:



The original keyboard image may be found on Wikipedia here:
https://upload.wikimedia.org/wikipedia/commons/5/51/KB_United_States-NoAltGr.svg
This file was derived from:KB United States.svg, CC BY-SA 3.0,
https://commons.wikimedia.org/w/index.php?curid=11391326

As utilized by the Q Keyboard software, the U.S. QWERTY is understood to have this configuration:

QWERTY



A full-size hardware-defined Q Keyboard would contain discrete **AA**, **BB** and **CC** modifier keys, likely on both sides, and would not reuse existing keys like the repurposed **Ctrl** and **Alt**. For such devices, there would only be a single keyboard and only one device driver. A hardware-defined Q Keyboard adapted for use on laptop computers might only have one set of modifier keys, due to space constraints.

Capitalization rules

Capitalization on the Q Keyboard works a little differently than other keyboards you may be familiar with. This is because it has more modifiers, and they are used in unique ways.

Capitalization affects how this Help document describes and discusses the various Q Keyboard modifiers. See Understanding modifier key notation for more information.

1. Capitalization of base keys

When you use the Q Keyboard for the letters and symbols on the standard U.S. QWERTY keyboard, the Shift and Caps Lock work as usual. There is nothing new to learn.

The only reason for mentioning this is that some advanced international keyboards might use Caps Lock to switch between two different alphabets, for instance, between English and Greek. The Q Keyboard doesn't do that, because its design is committed to being identical to a U.S. QWERTY when its special features are not being used. The only means to access non-English letters is with the use of **Live Keys**, **Dead Keys** and ***Held keys*** via the **AA**, **BB** and **CC** modifiers. The keyboard never alters the meaning or function of Shift or Caps Lock.

> The Q Keyboard does not alter **other** non-data keys either, except as needed to provide alternate locations for the Windows Logo and Windows Application keys. Keys that may be altered in that way include Windows Application (used as Logo), Print Screen and Scroll Lock. See Regional layout variants for more information.

2. Handling of Caps Lock

Like a standard QWERTY keyboard, **Caps Lock** only applies to the letters A-Z. None of the other keys are affected. Ordinarily that wouldn't matter, but because the Q Keyboard assigns some **letters** to non-letter keys, you will not be able to take advantage of Caps Lock when typing them. You will just have to hold Shift as needed.

> For example, the Cyrillic letter **ж Ж Zhe** is on the left **[** bracket key when used with Dead Key W. To get the upper case **Ж** Zhe, you could use either the Late Shift or Early Shift method discussed below, but just setting Caps Lock on won't work. That is because Caps Lock has no affect on the **[** bracket key when used as a normal QWERTY key, and so it has no effect here either.

Whenever you hold down any of the **AA**, **BB** and **CC** modifiers **for any purpose**, and you happen to have Caps Lock on, ***Caps Lock will be ignored*** until you release all of the Q Keyboard modifiers. The reason for this has to do with the protocols built into Windows for communicating with keyboards, and is something that cannot be changed. The effect

this has on the various modifiers and the kinds of keys you can type is discussed next.

> If making Caps Lock work when using AA, BB or CC were technically possible, it would still be a bad idea, because then it would also effect the normal operation of the QWERTY part of the keyboard, and our design calls for the QWERTY part to work exactly the same. So, we wouldn't want to change how Caps Lock worked, even if we could.

The main thing to remember is that if you need to type a large number of all-caps non-English letters, you will (usually) not be able to use Caps Lock to accomplish this. There are two alternatives you can use:

- If the number of letters you need is not too large, just hold the Shift key as needed.

- For long passages, type your letters into a word processor or editor that has an upper case conversion feature.

Because the rules of Unicode are complex, including capitalization rules for various languages and scripts, it is important to **test** your software on the letters you are interested in, to make sure they are converted correctly. One might assume that capitalization was a simple process that never goes wrong, but sometimes it does. Unlike English letters, where case can be converted by simple arithmetic applied to the numeric character codes, other alphabets require elaborate lookup tables to determine how to do this. With each new release of the Unicode standard, its capitalization rules can change. It is possible for those rules to be defined or implemented incorrectly, or the rules may not reflect the most recent official orthography for a given national alphabet.

If you have a long or important document with non-English letters (especially if those letters are for a lesser-used language or a non-Latin script), and you plan to do a mass-conversion of text from lower-case to upper-case (or vice-versa), **test** this on a temporary copy of your document **first**, and **verify** that your software performs this operation properly.

3. Capitalization of Live Keys

A Live Key letter is one typed with at least one of the **AA**, **BB** or **CC** modifiers plus one data key, in a single step, without a separate accent-key being required. As noted above, when you hold any of these keys while typing, **Caps Lock will be ignored**. You must handle capitalization as discussed in paragraph (2).

When you are using only **one** of the **AA**, **BB** or **CC** modifiers, and you need a capital letter, hold the modifier and the Shift key together, then press your data key. For example, **CC+N** gives **ñ** and **CC+**Shift**+N** gives **Ñ**. As noted elsewhere in this Help, **CC+N** is normally shown as **CL N**, and **CC+**Shift**+N** is normally shown as **CU N**.

4. Capitalization of Live Key Chords

When you a Live Key with a **dual chord**, it may *imply* the case of the letter, without actually using Shift. A dual chord is **AB**, **BC** or **AC**, where **AB** means **AA+BB**, **BC** means **BB+CC** and **AC** means **AA+CC**.

The **implied case** works as follows:

- Using **AB** implies **lower** case
- Using **BC** implies **upper** case, even though you do **not** press Shift with **BC**
- Using **AC** does **not** imply case, because **AC** may be used for symbols that have no case *per se*

Many characters on **AB** and **BC** are letters, but not all, and so using these modifiers does not always imply a case.

For Hyper Keys, the chord **ABC** implies lower case, and **BCU** (which uses Shift) implies upper case. However, that is only a general rule. A number of Hyper Key characters are **not letters**, and have no case.

See Live Key Chords for more information.

5. Capitalization of Dead Keys

The Q Keyboard allows you to capitalize Dead Key letters in more than one way.

Using Late Shift

A conventional Dead Key keyboard requires you to hold **AltGr** and type the accent key. You then release the accent key and the AltGr, and finally type the desired letter. If you needed that letter to be upper case, you would press Shift before typing it. When Dead Key shifting is done this way, we call it a **Late Shift**, because Shift is pressed **after** AltGr has already been released. The Q Keyboard can be operated in the same way, except that its **AA** modifier is used instead of **AltGr**, but otherwise it's the same.

Typing Dead Key letters with Late Shift respects the Caps Lock state, because neither **AA** nor the other modifiers **BB** or **CC** are being held at the time you press the letter key. So, if you needed to type a number of upper-case accented letters as **Dead Keys**, you can enable Caps Lock without having to individually press the Shift key for each letter. Because of this, you can also do the 'trick' available on the standard QWERTY keyboard which allows you to 'reverse' a Caps Lock by pressing Shift, so that you get a lower-case letter even though Caps Lock is on.

Users with experience on other international keyboards may wish to use Late Shift and

Caps Lock as needed, when first learning the Q Keyboard, since it will be similar to what they are used to.

Using Early Shift

The Q Keyboard allows an alternative way to capitalize Dead Key letters, using **Early Shift**, which works as follows. Suppose you wanted upper-case Dead Key **Ṣ with Dot Below**. Using Early Shift,

- press and hold the **AA** key and Shift
- type the Dot Below accent on the **** key
- release the **AA** and Shift keys
- type the **S** key without using Shift; the letter **Ṣ** appears

This is called an **Early Shift** because Shift has been released **before** the data key **S** was typed.

Why would you want to use Early Shift?

- It allows you to 'insist' that a letter be upper-case, regardless of how Caps Lock is set.
- It is typed in a way that is similar to how ***Held Keys*** are used.

6. Capitalization of Held Keys

A Held Key requires the ***AA*** modifier to be continuously held down until the final data key is typed. For example, to get lower-case ***Held Key*** **ṣ with Dot Above and Below**, you hold ***AA***, press the **** key, press the **S** key, and finally release ***AA***.

For upper-case, Held Keys require you to **hold the Shift through the entire process**. We call that a **Full Shift**. Suppose you wanted upper-case ***Held Key*** **Ṣ with Dot Above and Below**. Using Full Shift,

- press and hold the **AA** key and Shift
- type the Dot Below accent on the **** key
- type the **S** key without using Shift; the letter **Ṣ** appears
- release the **AA** and Shift keys

You might notice that this is almost the same as typing **Ṣ** with just Dot Below, as seen in paragraph (5). The difference is that the third and fourth steps are reversed.

Avoiding 'junk' letters when capitalizing

The method just described is the **only** way you can capitalize ***Held Key*** letters. If you tried it any other way, you will see Dead Key Junk appear instead of the letter you want.

How else **could** you try it? If you used Shift only in the first half of the process and then let go, that would be like an *Early Shift.* If you used it only in the last half, that would be like a *Late Shift*.

The Q Keyboard does not support *Early Shift* or *Late Shift* for Held Keys, because testing has shown that such keying techniques can be confusing, awkward and error-prone. By having only one method of capitalizing, it is more reliable, and there is also less to explain and document. Using *Full Shift* in this situation really is the simplest way to do it. It is something that is easier to understand with keying practice than explaining it in words. Try it and see for yourself.

Redundant key assignments

A review of this document will show that some letters can be produced in more than one way. That is because the Q Keyboard implements a measure of **redundant key assignment** in its design.

For instance, the letter **Ë** with Diaeresis can be produced in any of the following ways:

1. Holding the **AA** modifier plus a Shift, type the **E** key.

2. Holding the **AA** modifier plus a Shift, type the **;** key, release all keys, and type the **E** key.

3. Holding the **AA** modifier plus a Shift, type the **;** key, release the **AA** key while continuing to hold the Shift key, and type the **E** key.

4. While Caps Lock is off, hold the **AA** modifier and type the **;** semicolon key, then release all keys, hold the Shift key and type the **E** key.

5. While Caps Lock is on, hold the **AA** modifier and type the **;** semicolon key without using Shift, then release all keys and type the **E** key.

This redundancy is intentional. Different typists will prefer different typing methods for different reasons. Key-assignment redundancy allows you to choose the technique you find easiest to remember and use.

Method 1 above is an example of a Live Key. It takes the fewest keystrokes to enter, but requires you to remember the specific key combination for that one letter. However, since there are a limited number of Live Key characters, and they are assigned in a logical manner, with practice and experience it should be relatively easy to remember them, especially those you use most often.

All of the Live Key letters with Diaeresis are typed this way. However, the **AA** modifier is used for more than this. That is, the **AA** key is not simply a "diaeresis key", just as an **AltGr** key has more than one purpose on a conventional keyboard.

> The statement about Live Key letters with Diaeresis is not totally accurate. There is a "hyper key" for the letter **ṅ** with Diaeresis. Hyper Keys are a special-purpose type of Live Key. See Hyper keys for more information.
>
> Note that the **AA** modifier is used for typing **Live Key** symbols *and* for **Dead Key** and ***Held Key*** symbols. In contrast, the **BB** and **CC** modifiers are *only* used for **Live Key** symbols.
>
> (The special key sequences **AL/BL** and **AL/CL** are somewhat of an exception to this rule.

See this article for more information.)

For instance, the letter **ŭ** with breve is produced with **AA P** rather than using the **U** key. This is because the **U** key is fully committed for other kinds of accented **U** letters. **AA P** does not produce **p̈ with Diaeresis**, since there is no such letter in Unicode. Other than the **P** key being 'somewhat near' the **U** key, you would just have to remember this. Not all Live Keys are 'obscure' in this way, but some **are**, and there is no alternative but to read the documentation and learn how they work.

If putting an accented **U** on the **P** key is so 'obscure', why wasn't **ŭ** placed on the **U** key where it *belongs*? The answer is that there are simply too many kinds of accented **U** letters. In addition to what can be typed using Dead Keys, there are **12** different kinds of accented **U** letters you can type as Live Keys. These are the **U** with **acute, bar, breve, circumflex, diaeresis, double-acute, grave, horn, macron, ogonek, ring above and tilde** - each with upper and lower case. Even using the **AA**, **BB** and **CC** modifiers in every possible combination, there is just not enough room to put every **U** letter on the **U** key. Some letters have to be relocated to nearby *neighbor keys*.

So why was **Ŭ with Breve** put on the **P** key, instead of some **other** kind of accented **U**? That particular type of **U** is used less often, in fewer languages, than other kinds of accented **U** letters. It is a matter of providing the most benefit for the most people.

If you look at the Live Key layout in Part 3, you will notice that the Live Key assignments for **P** and **Q** bear a number of similarities.

Methods 2-5 are examples of Dead Keys. Dead Keys on the Q Keyboard are used much like those on other international keyboards. Once you know that the **AA** key initiates a Dead Key sequence, and that the colon/semicolon key defines the Diaeresis accent, most typists can figure out the rest. You don't have to learn something unique for each letter with a Diaeresis. However, just as with other international keyboards, Dead Keys require more keystrokes, which cannot all be typed at the same time, and thus will be somewhat slower. (A good typist can type one pretty fast, though, after some practice.)

Similar to the situation with Live Keys, there are a few cases where the Dead Key for a given accented letter is not at its "native" key location. The Dead Key Guide should be consulted for the exact definition of each key when used with each available Dead Key sequence.

You also gain additional letters through the use of Held Keys, which are a variation on Dead Key letters. Using ***Held Keys*** is a technique not generally available on conventional keyboards. You will need to read about this feature to understand how it works.

Why does the Q Keyboard employ redundant key assignments?

Typists with prior experience using a Dead Key keyboard can get started more quickly by reading about the **Dead Keys** for the letters they are interested in, since they **work in a similar way**, and **there is less to learn**. Dead Keys on the Q Keyboard have additional features, which are discussed in later sections.

However, because **Live Keys are faster** and **take less effort**, you will benefit from taking the time to learn how the Q Keyboard's Live Key system works. Great care was taken in deciding where those Live Keys would be located and how they would operate, so once you understand the principles behind it, most of it should make sense. For the few letters that are not as easy or intuitive to remember as you might wish, a "cheat sheet" with a list of letters important to you may help. After that, with practice, you will remember the keys you use most often. You would then just refer to the documentation for any specialty characters or infrequently-used symbols you might need.

Thus, the **redundancy** in the design **addresses two different kinds of users**:

- those who want to use the keyboard **as quickly as possible** with the least time spent learning it
- those willing to learn more, in order to make their typing **as easy as possible**

Not all Live Keys are redundant

Even though there is some overlap between Live Keys and Dead Keys, there is not complete coverage between the two. That is necessarily the case, since there are some 481 unique characters assigned to Live Keys (excluding digraphs), and 2,285 characters assigned to Dead Keys. Between those two lists, there are 291 that exist in both lists, meaning that 190 characters exist only as Live Keys.

See Q Keyboard statistics for more information.

Many letters with Acute, Diaeresis, Grave and Tilde accents have Live Keys, but not all of them. Thus, there are no live keys for **ṕ** with Acute, **ḧ** with Diaeresis, **ǹ** with Grave or **ṽ** with Tilde. These were omitted as Live Keys because they are seldom needed, and room was needed for other more important and frequently-used Live Key letters.

Font issues

In order for the characters produced by the Q Keyboard to be useful, they have to be seen. That means a font must be available that is capable of displaying the Unicode characters you have typed. Often this will be a True Type font, but other font technologies are also available, such as Open Type and Graphite.

> If you happen to be using the Q Keyboard with an 8-bit code page, you can use any available font for that page, even bit-mapped (raster) fonts, provided your applications allow their use.

You should be aware that the relative quality of fonts varies considerably. Almost any font you might wish to use may contain flaws of one sort or another. It can be quite frustrating to deal with.

Some fonts, despite having attractive glyphs, do not behave well when you attempt to perform compositions with them. Other fonts having somewhat plain-looking characters may work nicely with composition. You can't judge a font by its appearance, so to speak.

There is no real way to know if a font is going to be suitable to your needs unless you test it. Even well known fonts from Microsoft such as Time New Roman, Arial, Courier New and Calibri have various errors, flaws and limitations. Fortunately, Windows 10 has significantly improved its font coverage. Calibri, Times New Roman, Microsoft Sans Serif, Consolas and Segoe UI are much better than in prior releases. Still, there are issues you will have to cope with.

Here are examples:

- Some letters you expect to look different may appear the same (Yogh **ʒ** vs. Ezh **ʒ** is an example; in some fonts, both letters look like Ezh).

- Some fonts will not compose correctly; symbols that are supposed to combine may not do so. You may also find that the same font may look fine when displayed in one application but not in another. (This very Help document has had to cope with that issue.)

- Some fonts will fail to account for varying heights of different letters, leaving accents in the wrong place, or they may locate them off the edge of a line so that they get overlaid, truncated or completely disappear. Some will place a single diacritic correctly, but will not apply two or more together.

- Some fonts compose well and are attractive, but use excessively large space between lines.

- In rare cases, fonts can be defective, displaying the wrong character or diacritic for a

given Unicode value, or letters that should display two diacritics (like, dot plus macron) may show one of the marks but truncate the other one. One font had instances where turned and reversed small capital R letters were completely wrong.

- Character coverage can be inconsistent. If you need a wide range of symbols, few fonts are likely to have every symbol you might want, and you may have to use multiple fonts in a document to obtain complete font coverage. (When an application can "mix and match" a number of fonts to ensure that all of your characters are displayable by ***at least one font***, they may refer to it as a Composite Font or Font Compositing.)

- Software may perform font substitutions when you don't want it to, or in ways you don't like.

- You have to consider the effect of sharing documents on other systems when using many fonts. You may need to "embed" a font in your document, but your software might not allow it, or it may allow it but doing so may very greatly increase the size of your document, perhaps more than is acceptable.

In addition, different software may respond differently to a given Unicode sequence. One might assume that the same sequence of character codes would display the same way everywhere, all the time. In practice, the degree of compliance with the Unicode standard varies between one software product and another. The Unicode standard is complex, and not all editors or word processors handle it correctly in all situations. This is especially true if you depend on Unicode features that are specialized, seldom used or were introduced only recently. That may mean the feature has not been as well-tested on the applications you are using, and has received less user feedback to notify developers of any issues.

You may also run into font compatibility issues across operating systems. The Q Keyboard software currently operates on Windows, but generally the same True Type font files can be read and processed on Apple and Linux systems. While these systems may accept the same font specification data from the same files, they each render them with font display engines specific to their system. There is no guarantee that those font rendering engines implement identical semantics and behavior (even though they ought to). You may discover discrepancies in how the same document appears when displayed on different systems.

Of course, the Q Keyboard knows nothing about fonts or software. All it can do is generate a stream of Unicode characters and pass them along to the host computer. To get the most out of it, you need to understand your environment, and if necessary, perform tests to confirm that it works properly according to your needs. If you are just typing straight-forward text, you shouldn't run into too many problems.

If something doesn't appear the way you expect, you may be able to determine the cause by changing the font you are using and trying again. This advice also holds true if you suspect the Q Keyboard device driver is malfunctioning. That is certainly a possibility, as it is simply software and is subject to review and correction. However, before concluding

that the Q Keyboard is at fault, try two of three other fonts and see what happens.

> The author had to take these very steps after getting peculiar results from a test, only to discover that a font displayed "half ring" combining diacritics with the wrong orientation, and it also changed the type of accent on one letter based on whether it was Bold or Regular. In another test, a special Modifier Letter was displayed with a completely wrong glyph. Fonts contain thousands of glyphs, and each symbol has to be validated manually. Font vendors only have so much time and money to do this, and errors are bound to crop up.

The more specialized or unusual a character is, the greater chance that a font could reveal an error. If you are typing letters you rarely use, be sure to verify the results before printing your documents. That is especially true if you have an existing document with special characters, and then you perform a document-wide change of font (or, a change of a font ***attribute***, like Bold or Italic, or a change of case between upper and lower). The original document might have printed properly, but after you change the font, it could introduce errors. Whenever you perform a document-wide change of this type (even a seemingly "innocent" change), always re-verify your document. For important or lengthy documents, it is best to make a backup copy first before applying document-wide changes, to avoid data loss if things don't work as expected.

Font problems caused by older software

An issue you might encounter is that a certain character may appear as an "empty box" symbol, even though the Q Keyboard is operating properly, and the font you are using has a definition for that character. How can that happen?

Font issues and Unicode support are complex. The Unicode standard is periodically updated, and was on version 10 as of June 2017, with version 11 released in June 2018. If you use software like a word processor that was built before a certain version of the Unicode standard was established, and you attempt to type a character that did not exist in Unicode when the word processor was released, that character may appear as an empty box symbol, because it was undefined as of the date your software was created.

You may or may not be able to work around this, but the most likely solution is to update your word processor or other software to a more recent version designed to support later a revision of the Unicode standard.

This issue occurred during the preparation of this Help document, especially in the Dead Key Guides. You should be able to determine what the actual character is by typing it into some software like Microsoft Word, or by referring to a Character Map application.

The Q Keyboard as an incentive to improve existing fonts

Should the Q Keyboard become widely used, it could serve as an incentive for software companies and font vendors to improve their current font offerings. Since the Q Keyboard exposes a large subset of Unicode, many letters and symbols that you might not have been able to directly type in the past are now available to you.

> Microsoft publishes a specification called the Windows Glyph List, currently known as WGL4, which describes a preferred set of 656 characters that should be available in all fonts. The Q Keyboard can produce nearly all characters in WGL4, except for a few rarely-used legacy punctuation marks from MS-DOS and box-drawing symbols that combine both single and double lines. A similar list could be devised, which we could call the "Q Keyboard Glyph List" or QGL, containing a glyph for every symbol on the Q Keyboard. The QGL (should one be made) would comprise over 2400 glyphs. (See Q Keyboard statistics for precise figures.) Ideally, a font vendor would create a font that was a superset of these, having every character in both WGL4 and QGL.
>
> When the Q Keyboard eventually gets implemented as a hardware-defined device, keyboard manufacturers are encouraged to work with computer companies and font vendors to develop or update fonts so that they completely cover the font repertoire of the Q Keyboard. For instance, it would be beneficial if Microsoft chose to update their popular fonts like Times New Roman, Courier New, Arial, Consolas, Tahoma and Calibri to incorporate every glyph that can be typed on the Q Keyboard, and to ensure that all of their symbols are error-free and operate properly with all combining modifiers. Time will tell if font vendors make such efforts.

If you have a favorite font, but find that some Q Keyboard letters are not represented in it, or that some combining accent marks are not working as you would wish, you are encouraged to contact your font provider and ask them to add those symbols and otherwise provide the support you need. If enough users do this, it may be just the motivation those companies need to justify the effort to improve their fonts. That is something that everyone would benefit from.

Suggested fonts

The author does not endorse any particular fonts, but those listed below have proven helpful during the development and testing process of the Q Keyboard. You may find the information below useful.

> The Q Keyboard installation file you have received may be bundled with publicly available font files from various suppliers, as a convenience to you.
>
> **Before you install any of these bundled font files, be sure to visit the font supplier's web site to review and accept their font licensing agreement**.
>
> If you do not agree with a font supplier's license agreement, you should not install their bundled font installation file that came with the Q Keyboard.

As discussed in the preceding article, many fonts have issues with font metrics and font attributes, handling of combining modifiers and inter-line spacing. It is your responsibility to test the fonts you use, to confirm that they meet your requirements. Based on the ideal characteristics that a font should adhere to, no existing font could currently be called "perfect". You will eventually encounter issues and have to cope with them.

- **Calibri** from Microsoft was used to compose most of this document
- **Arial Unicode MS** from Microsoft is often helpful
- **Segoe UI** and **Segoe UI Symbol** from Microsoft have several glyphs not available elsewhere
- **Lucida Sans Unicode** from Microsoft, despite its name, has limited Unicode coverage
- **Microsoft Sans Serif** has excellent coverage of accented **letters**, but has almost none of the special punctuation and math symbols in the U+2xxx region of Unicode. That could pose a problem if you wanted to compose a technical document in a non-English language and were limited to a single font. In such cases, DejaVu Sans might be a better choice; see below. (It is regrettable that they did not merge Microsoft Sans Serif with Segoe UI Symbol. That would have created a character repertoire that covered nearly the entire Q Keyboard character set.)

- **Roman Cyrillic Std** from Kodeks is a remarkably complete font, with excellent coverage of many of the characters supported by the Q Keyboard including some not available in any other font (though not every single one). It comes in a single font face that resembles Times New Roman, but does not have versions for bold or italic. This font has a few shortcomings. Some of the stroke widths and font sizes are inconsistent, some letters are not correctly aligned on their base line, and not all combining symbols

work as well as they should. (It is *possible* this is an idiosyncrasy that only affects Windows users; the issue is under review.) Those things affect only a minority of characters; most are rendered correctly. There is a freeware version and a pro version that is available for purchase. The pro version has a restricted license agreement and can be expensive. If you only need a font for personal use, the freeware version should work well for you. Version 7 of this font supports the Unicode 11 standard. As of February 2019, this font supports the CopyLeft symbol at U+1F12F and other new characters, and has corrected some long-standing issues.

http://kodeks.uni-bamberg.de/AKSL/Schrift/RomanCyrillicStd.htm
http://kodeks.uni-bamberg.de/AKSL/media/RomanCyrillic_Std.ttf

- The **Quivira** font by Alexander Lange is, according to its web site, a free Unicode font in the OpenType format. Quivira is a proportional serif font similar to Times New Roman and Garamond. It has exceptionally complete coverage of western European languages, Greek, Cyrillic and many special characters. With very few exceptions, nearly the entire repertoire of the Q Keyboard is available in Quivira. This font does not do well with combining diacritics. Several diacritics are missing, and accents are often placed improperly, so if you need to add accents, Gentium Plus may be a better choice. The current version is 4.1.

  http://www.quivira-font.com/

- **Everson Mono**, from Michael Everson. This was initially a plain, monospaced sans serif design. Later, bold and italic faces were added. The stroke width is narrow, so that Everson Mono "bold" is comparable to non-bold in other fonts; when rendered in small font sizes it can be faint and hard to read. Everson Mono is very complete; often, a character may be found in Everson Mono that exists in no other font. The font attributes for Everson Mono have issues; combining diacritics often do not look right or align properly, especially on capital letters. (Compare ċ and Ċ where the dot above on the capital C almost disappears.) Because this is monospaced, it might be useful in text editors used for Information Technology applications where Unicode text is accepted, such as in the Java programming language.

  http://www.evertype.com/emono/

- **DejaVu Sans** (this is a large family of related fonts). DejaVu contains many symbols not present in other fonts, including extensive support for math symbols, and has a wide variety of font faces with excellent coverage of the Q Keyboard character repertoire. Some archaic and lesser-used letters and phonetic symbols are missing. At the time of this writing, web pages for the DejaVu fonts, other than those for downloading, were unresponsive. This may be a temporary technical issue, or possibly an indication that the font is no longer being actively developed. Its current status is unclear.

  https://dejavu-fonts.github.io/

- **Gentium Plus** (and other fonts from SIL). SIL fonts have attractive and comprehensive character repertoires and function well with combining modifiers, but exhibit large inter-line spacing. Its support of math symbols is limited, but it does well with specialized, archaic and seldom-used letters. There is also a related font, **Gentium Plus Compact**, that has smaller inter-line spacing, which you may prefer.

  http://software.sil.org/gentium/

- **Noto** ("No more Tofu"), a new font family created in 2016 by Google. The design goal of Noto is to be so complete that the undefined-character "empty-box" symbol (what they call "Tofu") does not appear. The initial font release does not yet meet that goal, but their efforts are promising. Noto does currently in fact have some undefined "tofu" symbols, even for seemingly ordinary punctuation and letters. Google has stated it eventually plans to have full support for Unicode version 9.0 (except for Asian symbols). The accent marks on some Noto letters are rendered faintly and can be hard to distinguish. Additionally, Noto is not just one font, but is divided into categories, so that Latin letters and general punctuation and math symbols are in different font files; that design may or may not suit your needs. For technical reasons, Noto font files cannot be merged together into one "super" font file. (Google is aware of this problem, but has not resolved it as of early 2018.) Because Noto is a new font, and is actively being developed and corrected as errors and limitations are identified by its user community, it could not yet be considered stable. If you encounter issues with Noto, it is recommended that you check back with Google to see if an updated version is available.

  https://www.google.com/get/noto/

Some "universal" fonts exist that attempt to implement a large subset of Unicode, which may or may not be helpful to you. These fonts may use glyph designs that are simplistic (even crude), but have an extensive character set. Sometimes these are referred to as "fonts of last resort" that can be used to display a character when nothing else will work. However, it should not be necessary to use such simplistic universal fonts except in very limited circumstances. Everson Mono is a good candidate for a universal font, and in most cases should have nearly everything you might need. For more refined fonts with excellent coverage (though not quite as extensive as Everson, and only one font style each) are Roman Cyrillic Std and Quivira.

For most users, the **DejaVu Sans** font coverage is extensive enough that it should have everything you need on a regular basis. Note that the **Sans** font has far more characters than any other in the DejaVu font family. The Windows **Calibri** font, as of Windows 10, has greatly improved and may also be a good candidate.

Live keys

This section describes one of the more notable and unique features of the Q Keyboard: its support for **Live Keys**.

Typing of Live Key letters is fast and responsive. Because of the large number of Live Keys available to you, many languages can be typed without the need to use any Dead Keys at all. A language not requiring Dead Keys is called Live Key Conformant.

Introduction to Live Keys

Conventional international keyboards frequently use **Dead Keys** to make additional letters and symbols available.

> They get this name because Dead Keys are typed as a two-part sequence. While the host is waiting for the second part of the sequence to be completed, seemingly nothing happens, so the computer appears to go dead. In the days of typewriters, a dead key accent would prevent the carriage from advancing one column, so the normal forward motion of the carriage appeared to go dead.

The Q Keyboard also has Dead Keys, but its most convenient feature is the presence of **Live Keys.**

What is a "Live Key"? It is a letter or symbol that is **directly produced** as a result of holding one of the **AA**, **BB** or **CC** modifiers - and optionally a Shift - and then pressing one letter or "data key".

> The easiest way to compare Live Keys and Dead Keys is to look at the use of data keys. A "data key" is a key that has a letter, digit or punctuation on it, while non-data keys are things like Enter and Shift. A **Live Key** sequence uses **one** data key, while a **Dead Key** or ***Held Key*** sequence uses **two** data keys.

Consider this example:

- To type a lower-case **ë** with Diaeresis as a **Dead Key,** hold the **AA** modifier and press the **;** key. Then release both keys and press the **E** key.

- To type a lower-case **ë** with Diaeresis as a **Live Key,** hold the **AA** modifier and press the **E** key.

There are two main differences between a Live Key and a Dead Key:

First, Live Key characters involve ***fewer keys***, and these are pressed at the same time. When this is done, the Live Key character appears immediately. So, a Live Key is ***faster***, more responsive, and generally require less keying effort.

> Live Key characters are like shifted letters. You would not *literally* press a Shift key and a letter key at precisely the same time to get a capital letter. (It might not work. You could get a lower case letter instead, or your keyboard might malfunction.) Rather, you first hold the Shift key down, and while continuing to hold it, you would **then** press your letter key. The same it true of the Live Key modifiers AA, BB and CC. At the end of the process, you *will* being holding both of them at the same time, but you have to start by pressing the modifier key(s) first, and **then** the letter key, just as you would with Shift. The keys AA, BB and CC are modifiers just as the Shift key is, so the timing and order for

using them involve the same concepts.

Just so it's clear, if you had to press a modifier **and** the Shift, or two modifiers **together**, it doesn't matter what order you do it. So, **CC** then Shift, or Shift then **CC** work the same way. Any combination of modifier keys can be pressed in any order.

Second, once the desired modifier(s) are held down, a Live Key character is **repeatable**. For instance, in the example above, if you continued to hold down the **E** key, the **ë** with Diaeresis letter would be repeated until you let go of the **E** key.

In contrast, a Dead Key is **not** repeatable. The Dead Key sequence is a two-part process, which cannot be pressed at the same time. For each desired character, the complete sequence of keys must be retyped as many times as needed.

Every language is different, but as a rule, words with accents don't often repeat them as a pair, such as **áá** or **ëë.** So, the fact that Dead Keys are not repeatable should not be a great concern, because you usually won't need to repeat them. In cases where accents **are** repeated, these often involve one of the accented letters that are also available as a **Live Key**, such as vowels with Grave, Acute, Circumflex, Diaeresis, Macron, Tilde or Ogonek.

If this is an issue for you, there may be means to compensate. You could define a word-processor macro to type an accented letter normally needing a Dead Key, and then this would be assigned to a programmable key. Or, you might create a macro that typed a doubled letter pair. You might also create a macro that backspaced over a preceding letter, copying it into the clipboard and then pasting it back, creating a second one. However, these techniques would not work outside your word processor. There are also keyboard enhancement products that enable application-independent keyboard macros that might be of benefit to you.

One example of key-macro software can be found at https://autohotkey.com/. Be aware that "hot key" enhancement products require the use of reserved key sequences. The problem with such key sequences is that they might overlap what the Q Keyboard uses for its own purposes, or they could conflict with other software. Thus, "hot key" software may or may not work for you. You would have to test it.

How do Live Keys compare with AltGr on other keyboards?

On other international keyboards, **AltGr** may interact with some keys to make extra characters available in a way that is comparable to Live Keys. The Q Keyboard uses its **AA** modifier for **Dead Keys** and ***Held Keys***, and for several **Live Keys**, and so AA has certain similarities to AltGr.

There are some important differences that make Live Keys superior to typical AltGr usage:

- Because there are three Live Key modifiers instead of one AltGr, many more Live characters can be made available.

- The direct-access keys available on an AltGr keyboard are generally present only to complete the letters needed for a particular language, such as French or German, which may be on the order of 10 to 20 additional characters at most. In contrast, the Q Keyboard supports some 480 Live Key characters. That allows the keyboard to be Live Key Conformant with 283 known languages, as discussed in Language statistics. That does not mean that an AltGr-based keyboard could not be made more comprehensive, but in practice this is not done. Most keyboards are not designed to be truly international but only address a limited audience, to reduce complexity and lower costs.

- The design of the Q Keyboard allows flexibility in where the Live Key modifiers are located. In contrast, a standard international keyboard always places AltGr where the right Alt key is on QWERTY, whether that is where you prefer it to be or not. (Presently, the Q Keyboard locates AA, BB and CC only on the **left** side, but right-hand versions are feasible and could be made available if there were user demand for it.)

- The AA, BB and CC modifier keys used by Live Keys will not cause the kinds of **software compatibility problems** that AltGr can sometimes do. See Why is AltGr not used? for more information.

Live Key Conformant languages

Because of the large number of **Live Keys** available to you, many languages can be typed without the need to use any **Dead Keys** whatsoever. When a language can be typed using Live Keys exclusively, it is said to be **Live Key Conformant**.

The following is an abbreviated list of 123 out of 283 languages that were found to be Live Key Conformant, which also reportedly had at least 1,000,000 speakers.

See Part 9 for detailed information on all supported languages, including languages that are Live Key Conformant but having less than 1,000,000 speakers. That list also shows the number of non-Live Key letters needed for each alphabet. As discussed in Language statistics, a number of languages are ***nearly*** Live Key Conformant, needing just a few Dead Key letters.

> What appears below is based on available reference materials and is believed correct, and represents the best efforts of the author, but no guarantee of completeness is implied or should be assumed. Because reference works continue to be revised over time, there are already more known documented languages that are Live Key Conformant than appear in the list.
>
> Some languages asserted below as "Live Key Conformant" might in fact require an unknown number of additional symbols for that language which are not Live Key letters. That would be the case if reference works for a language failed to fully document letters that required the use of **Dead Keys**, ***Held Keys*** or the use of undisclosed combining accents. While there are currently no known situations of this sort, there is a possibility of it.
>
> Should you find a Latin language containing letters not supported on the Q Keyboard, or a language listed below that is in fact **not** Live Key Conformant, you are invited to forward that information to the author so this list can be corrected. See the beginning of this document for contact information.

To be on this list, a language must use only those letters available as Live Keys, and must have at least one accented or special letter not present in English. (A letter like **þ Thorn** has no "accent", but it's not an English letter either.) There are many languages that use only English letters A-Z, and these are not counted. See Language statistics for more information.

Some languages like Afrikaans do use accents, and are Live Key Conformant, but in practice those accents are not heavily used in everyday writing. Afrikaans is included in the list, even though it does not take advantage of the capabilities of the Q Keyboard very extensively. Note that in the past, Afrikaans used **Small Letter ’n Preceded by Apostrophe**. The Unicode standard describes this as a deprecated letter, which is defined on the Q Keyboard as ***Held AL , N*** and ***Held AL ' N*** rather than as a Live Key. However, preferred

usage calls for a separate apostrophe and regular letter **n**, so when typed in the recommended way, Afrikaans is Live Key Conformant. The Q Keyboard supports Letter ʼn Preceded by Apostrophe, even though it is deprecated in Unicode, for sake of completeness and because it remains present in the Windows WGL4 character list.

> Afrikaans can use accents on 13 letters, these being **á**, **é**, **è**, **ê**, **ë**, **í**, **î**, **ï**, **ó**, **ô**, **ú**, **û** and **ý**, which are all **Live Key** letters. However, a review of many samples of Afrikaans found these accents used only sparingly. See https://en.wikipedia.org/wiki/Afrikaans for more information.

Where languages have both Latin and Cyrillic alphabets, only their modern Latin orthographies are considered for being Live Key Conformant.

"Polynesian" is not a language *per se*, but is a general class of languages that use vowels with macrons and Turned Comma as a punctuation, such as Hawaiian. In general, Polynesian languages are Live Key Conformant. (A few languages may require a specialized *glottal stop* punctuation mark that can only be typed as a Dead Key.) See Polynesian languages for more information on this subject.

The numbers of speakers shown below are round-number estimates, for comparison purposes only. Determining accurate language population statistics is often difficult. Some figures are known to be out of date by one or more years. Counts are generally based on the Omniglot web site.

The Kazakh language is Live Key Conformant when based on its **older** Latin orthography, prior to adoption of its current Cyrillic alphabet. A newly-proposed, revised Latin alphabet (if it retains the features publicized in 2018) would be *nearly* Live Key Conformant, with only letter **ǵ Ǵ with Acute** requiring a **Dead Key** to type. For more information on the Kazakh language, see:

> http://www.omniglot.com/writing/kazakh.htm
> https://astanatimes.com/2018/02/kazakhstan-adopts-new-version-of-latin-based-kazakh-alphabet

Language	Number of speakers
Acehnese	3,500,000
Afaan Oromo	30,000,000
Afrikaans	20,000,000
Akan	7,000,000
Albanian	8,000,000
Alur	1,400,000
Aymara	2,200,000

Azeri/Azerbaijani	32,000,000
Bambara	3,000,000
Bashkir	1,500,000
Bavarian	13,000,000
Belarusian	7,500,000
Bemba	3,600,000
Bikol	2,400,000
Bouyei	2,600,000
Brahui	2,200,000
Bugis	4,000,000
Cape Verdean Creole	1,200,000
Catalan	9,500,000
Cebuano	20,000,000
Chichewa	12,000,000
Croatian	5,500,000
Czech	10,000,000
Danish	5,500,000
Dholuo	3,000,000
Dutch	20,000,000
Estonian	1,100,000
Filipino	70,000,000
Finnish	5,000,000
Flemish	6,000,000
Fon	2,500,000
French	300,000,000
Galician	3,000,000
Ganda	3,000,000
German	200,000,000
Haitian Creole	12,000,000
Hiligaynon	11,000,000
Hungarian	15,000,000
Iloko	10,000,000
Indonesian	170,000,000
Irish	1,700,000
Italian	60,000,000
Jamaican	4,000,000
Kam	1,500,000
Kapampangan	3,000,000
Kazakh	11,000,000
Khasi	1,600,000

Kikuyu	6,600,000
Kinyarwanda	7,000,000
Kirundi	4,500,000
Kituba	5,400,000
Kongo	9,000,000
Konkani	2,500,000
Latvian	1,400,000
Limburgish	1,600,000
Lithuanian	3,200,000
Low Saxon	3,000,000
Madurese	14,000,000
Makasarese	2,100,000
Makhuwa	2,500,000
Malay	18,000,000
Mandinka	1,300,000
Maninka	3,300,000
Mauritian Creole	1,200,000
Minangkabau	8,500,000
Nahuatl	1,500,000
Neapolitan	8,000,000
Nkore	2,300,000
Northern Sotho	4,200,000
Norwegian	5,000,000
Nuosu (Yi)	5,000,000
Occitan	6,000,000
Pangasinan	1,500,000
Piedmontese	3,000,000
Polish	55,000,000
Portuguese	220,000,000
Quechua	8,000,000
Rohingya	1,800,000
Romanian	24,000,000
Sango	1,600,000
Sardinian	1,200,000
Sasak	2,100,000
Sena	1,600,000
Shona	9,000,000
Sicilian	5,000,000
Sierra Leonean Creole	4,500,000
Silesian	1,250,000

Slovak	5,600,000
Slovenian	2,500,000
Soga	2,200,000
Somali	17,000,000
Soninke	2,100,000
Southern Sotho	5,000,000
Spanish	570,000,000
Sundanese	39,000,000
Susu	1,100,000
Swahili	50,000,000
Swati/Swazi	1,500,000
Swedish	9,000,000
Tagalog	57,000,000
Talysh	1,000,000
Tatar	7,000,000
Tausūg	1,000,000
Tok Pisin	4,000,000
Tshiluba	6,000,000
Tsonga	3,600,000
Tswana	4,400,000
Tumbuka	2,000,000
Turkish	70,000,000
Turkmen	6,400,000
Umbundu	6,000,000
Uzbek	16,000,000
Wa	1,000,000
Walloon	1,000,000
Waray-Waray	3,000,000
Wolaytta	2,000,000
Wolof	7,000,000
Xhosa	8,000,000
Yao	3,000,000
Yucatec Maya	1,000,000
Zarma	2,200,000
Zazaki	3,000,000
Zulu	9,000,000

Live Key chords

As noted earlier, a **Live Key** is a letter or symbol that is **directly typed** using one or more of the modifier keys **AA**, **BB** and **CC**. The use of one or more modifier keys, and an optional Shift, plus a data key, is called a **chord**.

> Technically, keys typed on the QWERTY Base and Shift levels are "chords" too, and in theory could also be called Live Keys, because they too produce their letters immediately and are repeatable. However, the term "Live Key" is reserved for a letter produced when at least one of the **AA**, **BB** or **CC** keys is involved.
>
> Note: While any combination of modifiers might technically be a chord, the rest of this Help document tends to limit the terms "chord" or "dual chord" to the combined use of **AA+BB**, **BB+CC** or **AA+CC**, known by their short names **AB**, **BC** and **AC**. For instance, Live Key letters with Tilde other than **ñÑ** use the **AB** and **BC** chords to type them. So, **õ** is on chord **AB O** and **Õ** is on chord **BC O**.

A modifier key can be combined with Shift, or in some cases with another modifier key. In this way, the keyboard supports 13 different "modifier levels". By having so many levels in which Live Keys can be used, many languages can be typed without requiring any Dead Keys at all. Among these are French, German and Spanish. That is important, since typing with Live Keys is faster and more responsive than using Dead Keys. See Live Key Conformant languages and Part 9 for the complete list.

> Don't let the fact that there are 13 modifier levels intimate you. Two of the levels are the standard QWERTY "Base" and "Shift" levels you have always known. Of the remaining 11, many just involve adding Shift to one of the other levels.
>
> Three levels involve AA, BB or CC alone. Two of them (AB and BC) are for lesser-used accents, such as Tilde. Level AC is used for special-purpose symbols that generally don't have upper-case and lower-case variants, such as the ordinal symbols ª and º. Finally, the "hyper" levels ABC and BCU are mostly used for adding complementary Macron or Macron Below marks to letters where these are not precomposed in Unicode. You will need Hyper keys only very occasionally. Thus, the number of levels you need to remember and use most often is much less than 13.

In this section, references to AA, BB and CC being "repurposed" keys only pertain to the *software-defined* Q Keyboard. On a hardware-defined Q Keyboard, AA, BB and CC are discrete physical keys.

The 13 modifier levels available to you are as follows. **The wording below for the various levels is intentionally repetitive, so that each description would stand on its own**.

See also Understanding modifier key notation for a concise summary of the various codes

used.

1. Base.

This is the keyboard being operated without any modifiers. The Base level is used to type standard U.S. QWERTY lower-case letters and unshifted symbols, and operates identically to a conventional (non-enhanced) U.S. QWERTY keyboard. When Caps Lock is on, unshifted letter keys act the same as the Shift level, while non-letter keys are unaffected by Caps Lock.

2. Shift.

This is the keyboard being operated with one of the Shift keys held down. The Shift level is used to type standard U.S. QWERTY upper-case letters and shifted symbols, and operates identically to a conventional (non-enhanced) U.S. QWERTY keyboard. When Caps Lock is on, shifted letter keys act the same as the Base level (that is, the 'sense' of the Caps Lock gets reversed), while non-letter keys are unaffected by Caps Lock. The Q Keyboard does not remap either of the Shift keys or the Caps Lock key, so these operate as usual. When combining a Shift with one of the **AA**, **BB** or **CC** modifiers, you can use either Shift key.

> For the remaining modifier levels, the behavior of the **AA**, **BB** and **CC** modifiers is not affected by the Caps Lock key. When you hold down any of the **AA**, **BB** or **CC** modifier keys, the Caps Lock state is **ignored**. The reason for this has to do with the protocols built into Windows for communicating with keyboards, and is something that cannot be changed.

3. AA.

This is the keyboard being operated with the currently-enabled **AA** modifier key, which may be one of the repurposed (remapped) **Alt** keys. The **AA** modifier is used to type lower-case letters, such as **ë** with diaeresis, by typing **AA E** • To do this, press and hold the **AA** key, type the **E** key, then release all keys.

> **AA** (without Shift) **is also used to begin a Dead Key sequence**, usually for a lower-case accented letter. See the section on Dead Keys for more information.
>
> Because ***Held Keys*** are a variation on **Dead Keys**, a ***Held Key*** sequence also begins with the **AA** modifier key. See the section on Held Keys for more information.

To help remember this key, note that **AA** and **Alt** both begin with the letter **A**. To emphasize that using **AA** alone is intended for lower-case, the modifier level **AA** is

written as **AL**, signifying "**AA** used for **Lower** case". When you see the modifier **AA** discussed in the documentation (rather than **AL** or **AU**), it often refers to that modifier in a **general sense**, when the use of Shift (or not) is not important to understanding the point.

4. AA+Shift.

This is the keyboard being operated with the currently-enabled **AA** key plus a Shift key. **AA**+Shift is used to type upper-case letters, such as **Ë** with diaeresis, by typing **AA**+Shift **E** • To do this, press and hold the **AA** key and one of the Shift keys, type the **E** key, then release all keys. **AA + Shift is also used to begin a Dead Key or *Held Key* sequence**, usually for an upper-case accented letter.

For conciseness, and to emphasize that using **AA**+Shift is intended for upper-case, the modifier level **AA**+Shift is written as **AU**, signifying "**AA** used for **Upper** case".

5. BB.

This is the keyboard being operated with the currently-enabled **BB** modifier key, which may be one of the repurposed (remapped) **Windows Logo** keys. The **BB** modifier is used to type lower-case letters, such as **è** with grave accent, by typing **BB E** • To do this, press and hold the **BB** key, type the **E** key, then release all keys.

To emphasize that using **BB** alone is intended for lower-case, the modifier level **BB** is written as **BL**, signifying "**BB** used for **Lower** case". When you see the modifier **BB** discussed in the documentation (rather than **BL** or **BU**), it often refers to that modifier in a **general sense**, when the use of Shift (or not) is not important to understanding the point.

To help remember this key, you may note that the icon on the Windows Logo key looks like a "flag" with intersecting horizontal and vertical lines. If you have a good imagination, the flag icon **kind of** looks like an oddly-shaped capital letter **B**. That is quite a stretch of the imagination, but you may find that it works to help you to remember. You may also note that BB is **between** Alt and Ctrl.

6. BB+Shift.

This is the keyboard being operated with the currently-enabled **BB** key plus a Shift key. **BB**+Shift is used to type upper-case letters, such as **È** with grave accent, by typing **BB**+Shift **E** • To do this, press and hold the **BB** key and one of the Shift keys, type the **E** key, then release all keys.

For conciseness, and to emphasize that using **BB**+Shift is intended for upper-case, the

modifier level **BB**+Shift is written as **BU**, signifying "**BB** used for **Upper** case".

7. CC.

This is the keyboard being operated with the currently-enabled **CC** modifier key, which may be one of the repurposed (remapped) **Ctrl** keys. The **CC** modifier is used to type lower-case letters, such as **é** with acute accent, by typing **CC E** • To do this, press and hold the **CC** key, then type the **E** key, then release all keys.

To help remember this key, note that **CC** and **Ctrl** both begin with the letter **C**. To emphasize that using **CC** alone is intended for lower-case, the modifier level **CC** is written as **CL**, signifying "**CC** used for **Lower** case". When you see the modifier **CC** discussed in the documentation (rather than **CL** or **CU**), it often refers to that modifier in a **general sense**, when the use of Shift (or not) is not important to understanding the point.

8. CC+Shift.

This is the keyboard being operated with the currently-enabled **CC** key plus a Shift key. **CC+**Shift is used to type upper-case letters, such as **É** with acute accent by typing **CC**+Shift **E** • To do this, press and hold the **CC** key and one of the Shift keys, type the **E** key, then release all keys.

For conciseness, and to emphasize that using **CC**+Shift is intended for upper-case, the modifier level **CC**+Shift is written as **CU**, signifying "**CC** used for **Upper** case".

9. AA+BB.

This is the keyboard being operated with both the **AA** and **BB** modifier keys held down at the same time. This is called a **dual modifier** or **dual key**. The combination of **AA**+**BB** is intended to produce **lower-case** letters as Live Keys, where these letters exceed the capacity of the modifier levels previously discussed above. For instance, to type the lower-case **õ** with tilde, press and hold the **AA** and **BB** keys, type the **O** key, then release all keys.

The dual modifier **AA**+**BB** does not use the Shift key. The shift state (lower case) is <u>implied</u>, and **the Shift key should not be used**. (If you did attempt to use **AA**+**BB**+Shift it would do no harm, but no letters will appear, because this combination is not defined in the keyboard.) As noted above, Caps Lock is ignored. For conciseness, **AA**+**BB** can be written as **AB**. AB is just a notational shorthand. Thus, **AB O** and **AA**+**BB**+**O** both mean the same thing, and would produce the letter **õ** with Tilde.

10. BB+CC.

Similar to **AA+BB**, this is the keyboard being operated with both the **BB** and **CC** modifier keys held down at the same time. This is also a **dual modifier** or **dual key**. The combination of **BB** + **CC** is intended to produce **upper-case** letters as Live Keys, that exceed the capacity of the previous modifier levels discussed above. For instance, to type the upper-case **Õ** with tilde, press and hold the **BB** and **CC** keys, type the **O** key, then release all keys.

The dual modifier **BB+CC** does not use the Shift key. The shift state (upper case) is implied, and **the Shift key should not be used**. (If you did use **BB+CC**+Shift, this would active modifier level 13, also known as **BCU**, described below.) As noted above, Caps Lock is ignored. For conciseness, **BB + CC** can be written as **BC**.

11. AA+CC.

This is the keyboard being operated with both the **AA** and **CC** modifier keys held down at the same time. While it is also technically a "dual mode" modifier, we give it the distinctive name of **split modifier** or **split key** because you must 'split' your fingers between holding the **AA** and the **CC** keys, with the **BB** key in the middle unpressed. The combination of **AA+CC** is intended to produce special or one-of-a-kind letters and symbols.

Characters produced using **AA+CC** are often neither upper case nor lower case, and for this reason, no particular case is implied. For instance, **AA+BB O** is **õ** and **BB+CC O** is **Õ**, but **AA+CC O** is the symbol **º** which is the masculine-ordinal character, used in languages like Italian, Spanish and Portuguese. This ordinal character is not considered either upper case or lower case, but other characters like the digraph triples shown next do have an associated case.

As noted above, Caps Lock is ignored. For conciseness, **AA+CC** can be written as **AC**. **Do not use the Shift key with AA+CC**. (If you did attempt to use **AA+CC**+Shift it would do no harm, but no letters will appear, because this combination is not defined in the keyboard.

AA+CC is also used to type the third symbol for various **digraph triples**. Here is an example with the letter **L** in typing the three different digraphs of **LJ**, each of which are single Unicode characters. Observe the abbreviated notations **AB**, **BC** and **AC**:

AB L = lj
BC L = Lj
AC L = LJ

12. AA+BB+CC.

This is the keyboard being operated with all three modifier keys **AA**, **BB** and **CC** being held down at the same time. This is called a **hyper key**. Because holding down three modifier keys plus typing a data key takes more effort, it is reserved for symbols that are not commonly used. The main use for these hyper keys is to produce digraphs of **lower-case** letters with either a Macron or a Macron Below combining diacritic, as a complement to precomposed Unicode letters. For instance, there is a precomposed lower-case letter **ō** with macron above at U+014D, but there is no such precomposed letter as **o** with line-below. If you want to create one anyway, use **AA**+**BB**+**CC O** to create **o̱** as a composition of **o** and a line-below symbol joined together. It comprises a "digraph" of two separate data values, even though it visually appears to be a single symbol. This process simply automates a keying action that you could have done manually. So, the Hyper Key is used to type the "other" kind of "lined" letter.

Hyper keys are also used to type a few special characters, including some math symbols. As noted above, Caps Lock is ignored. For conciseness, **AA**+**BB**+**CC** can be written as **ABC**. Modifier level **ABC** is understood to be intended for lower case when it is applied to letters, and is **not** written as ABCL. **Do not use the Shift key with AA**+**BB**+**CC**. See Hyper keys for a full discussion of the various ways these keys are used.

13. BB+CC+Shift.

This is the keyboard being operated with the modifier keys **BB**, **CC** and a Shift key being held down at the same time. This is also a "hyper key", but we give it the specific name of **hyper shift** to emphasize that a Shift key is involved. Because holding down three keys plus typing a data key takes more effort, its use is reserved for symbols that are not commonly used. The main use for these hyper shift keys is to produce digraphs of **upper-case** letters with either a Macron or Macron Below combining diacritic, as a complement to preexisting Unicode letters. For instance, there is a precomposed upper-case letter **Ō** with macron above at U+014C, but there is no such precomposed letter as **O** with line-below. If you want to type one anyway, use **BB**+**CC**+Shift **O** to create **O̱** as a composition of **O** and a line-below symbol joined together. It comprises a "digraph" of two separate data values, even though it visually appears to be a single symbol. This process simply automates a keying action that you could have done manually. So, the Hyper Shift is used to type the "other" kind of "lined" letter.

Hyper shift is also used to type a few special characters, including some musical symbols. As noted above, Caps Lock is ignored. For conciseness, **BB**+**CC**+Shift can be written as **BCU**.

Live Key letter placement

Ideally, all accented **Live Key** letters should appear on the same key as their unaccented (base) letter. That is where they "belong", and this is done in many cases. For instance, the Live Key letter **ë** uses the **E** key. We describe this arrangement by saying that the letter **ë** is in its "native location".

Because some base letters have many different kinds of accents, we cannot always place every letter in its native location, even with the **AA**, **BB** and **CC** modifiers used in every possible combination. This issue affects vowels the most, since more kinds of diacritics tend to be placed on vowels than on consonants.

The various places that accented Live Key letters are found on the keyboard can be classified as follows:

Native

"Native" placement is reserved for the letter types used most frequently. For vowels, these are:

- **Acute** accent, using the **CC** modifier (**ñ Ñ** with Tilde also uses **CC**)
- **Grave** accent, using the **BB** modifier
- **Diaeresis** accent, using the **AA** modifier
- **Tilde** accent, using the dual modifiers chords **AB** for lower case, and **BC** for upper case

For consonants, native letters are generally placed as follows:

- **Acute** accent, using the **CC** modifier
- **Cedilla** and **Comma Below** accent, using the **BB** modifier
- **Caron** accent, using the **AA** modifier

Dual modifier chords **AB**, **BC** and **AC** are used for various purposes, including selected currency symbols, miscellaneous punctuation, and some **digraphs** and **digraph-triples**. They are also used for several lesser-used accented letters, including some African letters and variations of the letter **G**. However, these general rules do not hold in all cases because of other competing requirements. Refer to the Live Key List more information.

> The letter **ǥ Ǥ** with Dash Stroke is not one of the variations of **G** supported as a Live Key, but requires a Dead Key to type. The only documented use of **ǥ Ǥ** was found in the Skolt Sámi language, which has an estimated population of just 400 speakers. Priority had to be given to larger language groups.

Live Key placement of letters **ż Ż** with Dot Above and **ƶ Ƶ** with Dash Stroke

A placement of these letters consistent with letters **ẋ Ẋ** and **ċ Ċ** on the Q Keyboard would result in **ż Ż** with Dot Above being on **AB Z** and **BC Z**, and **ƶ Ƶ** with Dash Stroke placed elsewhere, such as on **BB Z**. This was not done, because **ƶ Ƶ** with Dash Stroke has limited usage. See https://en.wikipedia.org/wiki/Z_with_stroke for more information on this letter. The most common current use for **ƶ Ƶ** with Dash Stroke is as an alternative means of writing **Ż** with Dot Above, especially in Polish. It is also seen in handwriting throughout Europe, sometimes to distinguish letter **Z** from digit **2**. A few users may also wish to use **ƶ Ƶ** with Dash Stroke as a mathematical notation.

There are also historical uses of **ƶ Ƶ** with Dash Stroke in alphabets that are deprecated or no longer in use, including Janalif, Tatar, Chechen, Karelian and Mongolian. In contrast**, ż Ż** with Dot Above is actively used in Polish, a language having at least 55 million speakers. Thus, it is important to give more priority to the Dot Above form, and less to the Dash Stroke form. Putting **ż Ż** on modifier **BB** allows the lower case form **ż to** be typed more easily, with one modifier key instead of two.

There are also other accented forms of Z, such as **ẓ Ẓ** with Dot Below and **ẕ Ẕ** with Line Below, but those are rarely used too, so there is no obviously better alternative to **ƶ Ƶ** with Dash Stroke. And because those letters **are** rarely used, it will be easier for most people to remember them by their Dead Key forms.

For this reason, **ż Ż** with Dot Above appears on **BB Z**, while **ƶ Ƶ** with Dash Stroke appears on **AB Z** and **BC Z** respectively.

Live Key placement of letters **ł Ł** with Slash Stroke and **ľ Ľ** with Caron

A placement of these letters consistent with other Caron letters would put **ľ Ľ** with Caron on **AA L** and **ł Ł** with Slash Stroke somewhere else. This was not done, because **ł Ł** is used in Polish with some 55 million speakers, while **ľ Ľ** with Caron is primarily used in Slovak with about 5 million speakers. For this reason, **ł Ł** with Slash Stroke appears on **AA L**, and **ľ Ľ** with Caron is on **BB '** (quote).

Live Key placement of letters **ŵ Ŵ** with Circumflex and **ẅ Ẅ** with Diaeresis

The letter **W** is not often accented. The Welsh language, having about 700,000 speakers worldwide, employs four different accents on W, those being **ŵ ẅ ẃ** and **ẁ**. The African language Chichewa, having about 12 million speakers, uses **ŵ**. (Usage figures are round numbers; estimates vary.)

A placement of these letters consistent with others on the Q Keyboard would result in **ẅ** with Diaeresis being on its native **AA W**. This was not done, because of all uses of **W** in Welsh, **ŵ** with Circumflex is used more than any other type (based on available reference works). The remaining three accent types are used less frequently, and between them,

Diaeresis is used more than the other two. With that, and its use in Chichewa, **ŵ** with Circumflex needs to be given higher priority than other forms of **W**.

And, because the Cyrillic Dead Key is located on **AA W** we cannot place either **ẅ** or **ŵ** directly on **AA W**.

For these reasons, the letter **ŵ Ŵ** is placed on **AB/BC W**, and **ẅ Ẅ** is on the *neighbor key* **AB/BC Q**. All four types of accented **W** can also be typed as Dead Keys, if desired.

For the assistance of Welsh writers, **ŵ Ŵ** with Circumflex, and **ẁ Ẁ** with Grave accent, can additionally be typed using **AA [W** and **AA] W** as Convenience Dead Key letters. This allows all four types of Welsh **W** letters to be accented using the cluster of keys **[ ] ;** and **'** that are near each other on the right side of the keyboard.

Live Key placement of letters **ñ Ñ** with Tilde and **ń Ń** with Acute

A placement of these letters consistent with others on the Q Keyboard would result in **ń Ń** with Acute being on its native **CC N** and **ñ Ñ** with Tilde being on the dual modifier chords **AB N** and **BC N**. This was not done, for the following reasons:

- The main use of **Ñ** with Tilde is in the Spanish language, while **Ń** with Acute is used primarily in Polish. In terms of worldwide usage, there are roughly 11-12 times as many speakers of Spanish as Polish (a ratio of about 570 million Spanish speakers to 55 million Polish speakers), in addition to other, smaller languages that also use **Ñ** with Tilde. (Usage figures are round numbers; estimates vary.) This warrants giving the letter **Ñ** with Tilde a higher priority in terms of ease-of-use.

- With respect to diacritic usage across all languages, **Ñ** with Tilde is used far more than tilde on any other kind of letter, again justifying the special handling of **Ñ.**

- It is desirable to assign the digraph-triple **nj Nj NJ** to its native key **N** using dual modifier chords, to be consistent with other similar letters like **Lj.** If the letter **ñ Ñ** with Tilde were on the dual-modifiers, that would not be possible.

- Other N-type letters, like the letter Eng **Ŋ** and **Ɲ** with Left Hook are used less frequently, with Eng **Ŋ** used more than **Ɲ** with Left Hook**.**

- Even though Polish is used less than Spanish, 55 million speakers that use **Ń** is still a large number. The Belarusian language, having perhaps 8 million speakers, also uses **Ń**. This justifies placing the letter **Ń** with Acute on a key that is easy to type, even if it is not on its "native" key. By locating the letters **Ŋ** and **Ɲ** elsewhere, that frees up room for **Ń** to be located on **CC B**, the *neighbor key* of **N**.

- To support Vietnamese, it is necessary to have **Live Keys** for **Ư** and **Ơ** with Horn, in order for all of the single-accented vowels to be consistently available as Live Keys

without exceptions. **AA V** and **AA B** are set aside for this purpose. This was done because the key **V** will help in remembering this is a Vietnamese key, because **B** is a *neighbor key* to **V**, and because there were limited alternatives available to using these keys. Also, the shape of the letter **V** somewhat resembles **U** and that may help in remembering it. So, the use of the **B** key for Vietnamese affects the other uses for this key as discussed above.

The issue of consistency works both ways. Because some users might prefer to type these two letters as Dead Keys, the **Cedilla Dead Key** can be used as a **Horn Dead Key** for these two letters **alone**. Since there is no such thing as U or O with Cedilla, this dual usage does not conflict with the main purpose of this dead key, which is for Cedilla and Comma Below accents.

Based on these considerations, the Live Keys for **B** and **N** are assigned as follows. Note that **AC B** is Capital Ƀ with Dash Stroke. This character is gaining favor for use as a **Bitcoin** currency symbol.

	CC	BB	AA	AB	BC	AC
Key B	**ń Ń**	**ŋ Ŋ**	**ơ Ơ**	**ɲ**	**Ɲ**	**Ƀ**
Key N	**ñ Ñ**	**ṇ Ṇ**	**ň Ň**	**nj**	**Nj**	**NJ**

Southwest Vowels

To accommodate additional vowels, a row of 5 keys in the middle of the keyboard is set aside.

These keys are **F**, **G**, **H**, **J** and **K**. They are generally used for accented versions of **E**, **A**, **U**, **I** and **O**, respectively.

To remember the keys **H**, **J** and **K**, note where they are located relative to the keys **U**, **I** and **O**. For instance, the **H** key is **below** the **U** key, and to its **left**. The same is true of **J** and **K** with respect to **I** and **O**.

If we thought of the keyboard as if it were a "map", and the top of the keyboard were "north", we could say that the keys at **HJK** are "**southwest**" of the keys at **UIO**.

Extending this idea, we now say that the group of keys at **FGHJK** are the "**southwest vowel**" keys.

Here are some techniques to remember these Southwest Vowel keys:

- Think of **F** as the letter **E** with the bottom line removed.

- The letter **G** is vaguely like an **A** because they both have a **crossbar**. Otherwise, you will just have to remember it with practice. You might notice that **G** is between **V** and **Y**, and both of those letters have angled lines like **A** does. That may or may not help in remembering.

- For **H**, **J** and **K**, remembering the "southwest" concept will be the biggest help. For instance, when you want to type an **Q** with Ogonek, start by locating the **O** key, then look "southwest" - that is, **down** and to the **left** - from **O**, and you get to the **K** key. You type **Ǫ** with Ogonek using the **BB** modifier plus the **K** key.

- You might note that the top half of **H** resembles a squared-off **U**.

- You might also remember that **Ű** with Double Acute on the **H** key is the **Hungarian U**.

- **I** and **J** are next to each other in the alphabet, and **J** has a long vertical stroke like **I** does.

- Other than the "southwest" concept, there is no good way to remember that **K** is used for **O** letters, except possibly to associate it with the internationally known English word **OK**.

- On a hardware-defined keyboard, the circumflex vowels **Ê Â Û Î Ô** will have auxiliary legends on the **F G H J K** keys, and this will be the primary means of remembering them.

"Southwest" placement is reserved for letters used frequently, though used somewhat less frequently than "Native" types. These are:

- **Circumflex** accent, using the **CC** modifier
- **Ogonek** accent, using the **BB** modifier
- A variety of accents using the **AA** modifier. For the **F G H J K** keys, these are **Ě**, **Ğ**, **Ű**, **ı İ** and **Ő** respectively.

The letter **Ğ** with Breve on the **G** key doesn't follow the pattern of being an accented form of **A**, but **Ğ** is widely used in certain Eastern European languages, and a place was needed for it. Assigning Ğ to the G key also put it on its native key, which is always preferable. Note that the **J** key is used for the Turkish **I** having dotless lower-case **ı** and dotted upper-case **İ** forms.

Letter **ŷ Ŷ** with Circumflex is not a Southwest Vowel. When required, this can be typed as **Live Key CC V** or as **Dead Key AA ^ Y**.

This table summarizes the **southwest** usage, where the first three rows show the letters **unshifted** and **shifted**. The letters for Key+**AB** and Key+**BC** are for lower-case and upper-case. None of the letters on the last three rows use the Shift key.

Key	F	G	H	J	K

Key+**CC**	ê Ê	â Â	û Û	î Î	ô Ô
Key+**BB**	ę Ę	ą Ą	ų Ų	i̧ I̧	ǫ Ǫ
Key+**AA**	ě Ě	ǧ Ǧ	ű Ű	ı İ	ő Ő
Key+**AB**	ȩ	ǵ	ħ	ij	ḳ
Key+**BC**	Ȩ	Ǵ	Ħ	IJ	Ḳ
Key+**AC**	ƒ	'	″	ǰ	ĸ

Note: In some alphabets, the Ogonek letters preferred by native speakers of their language are not the standard ones, but are Ogonek-***like*** letters, having a bottom hook with a slightly different shape or attaches to the letter differently. See Apache and indigenous languages for more information. Because Unicode does not define such alternative Ogonek-like letters, you would have to use the official Ogonek vowels in Unicode, and then choose a font that renders them as you prefer. Sometimes, groups and organizations that represent the interests of smaller language groups have developed fonts that better suit their needs. An Internet search may turn up such font resources, should you need them.

Why are Southwest Vowels arranged as **EAUIO** on the **FGHJK** keys?

When you first read about the Southwest Vowels, you might wonder why they are arranged as they are. Wouldn't an alphabetical ordering of **AEIOU** make more "sense"? There are good reasons it was done this way.

- The **UIO** order for **HJK** helps you to find the letters easier if your keyboard does not have labels for them. For the **E** letters on **F**, the **F** looks an **E** with the bottom line missing. Using **AEIOU** ordering, it would not be possible to provide these "hints" about the meaning of each of these keys.

- Putting **E** leftmost on the **F** key places your left index finger on this key in the home row. In many languages, **E** is the most-used letter. This lets you get to that key with a strong finger, and does not require you to leave the "home" position.

- Likewise, putting **I** on the **J** key places your right index finger on this key in the home row. In many languages, **I** is a highly-used letter as well. Like letter **E** on key **F**, this also allows you to type the **I** key with a strong finger, and does not require you to leave the "home" position.

  Depending on which Q Keyboard modifiers you used and how you type, accessing keys on the "home" position may or may not actually be an advantage. The mnemonic ordering of the keys is still a useful feature in any case.

Are the assignments of Circumflex letters to the Southwest Vowels biased?

When a Live Key letter is on its native location, it is the easiest to remember and type. For vowels, native key assignments for **AA**, **BB** and **CC** are associated with Diaeresis, Grave and Acute accents, respectively.

It may be observed that among all possible diacritic types, there are what may be called the "Big Five" of accents. These are Diaeresis, Grave, Acute, Circumflex and Tilde. Why are Circumflex letters assigned as Southwest Vowel keys instead of being native?

A comparison of Diaeresis vs. Circumflex and Tilde vowels shows Diaeresis used perhaps twice as much as Circumflex or Tilde. Even so, accurate statistics are hard to come by, and the choice is admittedly a judgment call, one that could have gone either way. The deciding factor was that for Diaeresis, there is extensive use by the large population groups for French, German and Turkish, with additional use of **ü Ü** in Spanish, which at 570,000,000 speakers is the largest single language using Latin letters.

Users requiring Southwest Vowel keys for Circumflex and Ogonek may be disappointed that their preferred letters are not native. The truth is, because so many vowel types have to be supported, ***someone*** is going to be disappointed by ***something***; it can't be avoided.

> Could Circumflex letters have been placed where the **Tilde** vowels are, which use **AB** and **BC** modifiers? Yes. That would have made Circumflex letters a little easier to **remember**, since **ã Ã** is on **AB A** and **BC A**, for example, instead of being on the Southwest Vowel keys. However, aside from **ñ**, Tilde as an accent is used less overall than is Circumflex, and requiring **AB** and **BC** would mean you would always have to use two modifier keys, instead of being able to use just one for a lower-case letter like **ê**, meaning that they would be more work to **use**. In the long run, the current arrangement is a better one.

Once users of these letters gain familiarity with the Q Keyboard, they may grow to appreciate these key assignments, since they are all on the Home Row and should actually be easier to reach than their native key locations. For instance, **CC J** for **î** is easier to type than **CC I**, and the related **CC V** for **ŷ** is easier than **CC Y**. The best advice that can be offered is to give the Q Keyboard a fair evaluation, allowing enough time to fully understand and appreciate the keyboard's strengths and weaknesses.

> You may able to find "dry transfer lettering" at an art supply or office supply store, in order to place the letters **E A U I O** on the sides of the **F G H J K** keys on your keyboard. That could go a long way to easing the learning process. (This might be feasible for a full-size traditional keyboard, while a laptop keyboard or a keyboard with flat "chiclet" keys would probably not have enough vertical space on the sides.)

Northwest Vowels

Similar to the "southwest vowels", the numeric-key row is set aside for the "**northwest vowels**". Because these keys are used for other purposes as well, the northwest vowel keys are just associated with the **BB** modifier, primarily for vowels with Macron.

The Northwest Vowels could also be termed the **Polynesian Vowels**. Polynesian languages frequently use Macrons on their vowels. In addition to or instead of the Macron Dead Key on the **=+** key, you can use the Northwest Vowel keys to quickly type Polynesian letters. See Polynesian languages for more information.

These **BB** keys are defined as follows, showing the letters **unshifted** and **shifted.** (Unshifted key **BB** is also known as **BL**, and **BB+**Shift is also known as **BU**.)

Key	`	1	2	3	4	5	6	7	8	9	0
Key+**BB**	ə Ə	ā Ā	ɛ Ɛ	ē Ē	ʒ Ʒ	ǯ Ǯ	ȳ Ȳ	ū Ū	ī Ī	ō Ō	ø̄ Ø̄

Here are some techniques to remember these Northwest Vowel keys:

- The **Ā** with Macron is on the **1** key, which is "northwest" of the **A** key (**above** and to the **left**), by "going northwest through the **Q** key". You may also note that **1** is the **left-most** digit key, and **A** is the **left-most** letter on the second letter row.

- The **Ē** with Macron is on the **3** key, which is "northwest" of the **E** key. You may also note that the digit **3** is somewhat like a reversed **E**. (However, the "open E" letter **Ɛ** on the **2** key is even more like a reversed **3**, so this mnemonic may or may not be helpful.)

- The letters **Ȳ Ū Ī** and **Ō** with macron are on the keys **6 7 8** and **9**, respectively, which again are "northwest" of the keys **Y U I** and **O**.

- The letter **Ø̄** with slash and acute accent on **BB 0** (zero) resembles a zero. **Note that the letter Ø with slash but *without* an Acute accent is produced with CC 0** (zero).

On a Q Keyboard operating with the **QWERTZ** variant, the key to the right of the **T** key is the physical **Y** key but will function as a **Z** key. Even so, operating in non-QWERTY mode does not change the location of the key for **ȳ Ȳ** with Macron, which remains on the **6** key (northwest of the physical **Y** key) in all cases.

Neighbor keys

When Native, Southwest and Northwest key locations are not enough, we resort to **neighbor keys**. For instance, the key **Q** is useful as a neighbor key for **A** because:

- **Q** is the nearest "northern neighbor" of the **A** key
- The letter **Q** is infrequently used in non-English languages, and takes almost none of the

conventional diacritics that appear on other letters
- There are many variants of **A** that need to be assigned to a key

Live Key **Q** is utilized as follows:

- The letter **Æ** uses the **CC** modifier
- The letter **Å** with Ring Above uses the **BB** modifier
- The letter **Ă** with Breve uses the **AA** modifier
- The letter **ẅ** with Diaeresis uses the dual modifier **AB**, and **Ẅ** with Diaeresis uses **BC**
- The special symbol **⅊** is produced with **AC Q**. The symbol stands for "Aktieselskab" (a Danish business word, designating a stock-based corporation, according to Wikipedia). There was no especially great need for this symbol to be here in particular, but there wasn't a need for anything to be here either.

The Q Keyboard has other neighbor keys, used in similar ways. Refer to the Live Key List for more information.

Other key categories

Some Live Keys are used for a variety of purposes that don't fit any of the categories above. The **X** key is used in this way:

- The letter **Ɣ** uses the **CC** modifier; this is the Latin letter Gamma, used in some African languages
- The letter **Ş** with Cedilla is on **BB X** • Note that the **Ș** with Comma Below is on **BB S**
- **AA X** is used as the **Dead Key** introducer for Extra letters; ***AA X*** is a ***Held Key*** introducer
- The letter **ẋ** uses the dual modifier chord **AB**, and **Ẋ** uses **BC**
- The registered trademark symbol ® is produced with **AC X**
- **AA X X** will produce the **Schwa** letter **ə Ə** as an alternative to the **BB `** (grave) **Live Key**, which is somewhat difficult to type
- Because Dead Key **AA X** has no Literal symbols associated with it, and would otherwise end up unused, **AA X Spacebar** is used as an alternative way to type a non-breaking space. See Spacing and joining symbols.

Live Key list

The following table shows every character that can be directly typed on the IQ-Keyboard as a **Live Key**.

See Part 3: Keyboard Layout for Live Keys for a graphic representation of the Q Keyboard.

Representative keys for locations used as Dead Key diacritics are shown in **red with yellow background**.

Column headings are abbreviations of modifier levels. The column **Usual Case** is labeled that way because there may be exceptions to how letters are cased by that modifier. The modifier keys may also be used in some instances for special symbols that are neither upper-case nor lower-case.

The **Soft Hyphen** (SHY) symbol U+00AD on key **AB –** is not visible in all fonts and by all software. SHY is also known as a "discretionary hyphen" because it is up to the discretion of individual software applications whether or not SHY is displayed or acted upon. See Issues regarding Soft Hyphen (SHY) and Non-Breaking Hyphen for more information.

When you type **BCU =** a three-letter code will appear. This is the ***ID string***. It identifies which version of the Q Keyboard device driver is installed and currently active. A typical ID string is shown below.

When a symbol is shown with 3 dashes instead of a Unicode code-point value beneath, it represents a multi-character digraph or trigraph.

On selected keys, symbols shown in **white on a blue background** are **followed** by a non-breaking space, and symbols shown in **white on a red background** are **preceded** by a non-breaking space. In the list, the presence of a non-breaking space is denoted by a · Middle Dot, such as **· €** for a variation of the Euro symbol. For the Guillemet quotes **« ·** and **· »** on **AC <** and **AC >** these are followed and preceded by Narrow Non-Breaking Spaces, respectively.

The character **U+1F12F** at **BCU '** (apostrophe) is the "CopyLeft" symbol, added to Unicode in version 11 as of June 2018. This key will produce the correct Unicode code point, but there are few fonts that implement this symbol. Fonts are revised all the time, so you should check with your font vendor to see if support has been added. An approximation of this symbol is shown as **black on yellow background** to highlight its pending status. To use a *composition* of this symbol, the **trigraph (ɔ)** is available on **Hyper key ABC '** (apostrophe). (A "CopyLeft" symbol is intended to designate an otherwise-copyrightable work that is does not have a copyright and for which the author does not intend to obtain one.) **Update**: As of February 2019, the most recent Roman Cyrillic Std font supports CopyLeft.

If you need an "operating system" logo symbol, you might want to use the ⌘ character **U+2318** on ***Held Key AL `X.*** This is known as the "Place of Interest Sign" or "Operating System Key" and is used on Apple computers as the Command key, whereas you might see a "flag" logo on a Windows keyboard.

To learn more about any individual character, you can use the Character Map program provided by Windows.

There is also a third-party utility called **BabelMap** that you may find useful.
Their web site is http://www.babelstone.co.uk/Software/BabelMap.html
Software is periodically updated, so be sure to check if you have the most current version.

Finally, the Unicode Consortium has a wealth of information available.
Their web site is http://www.unicode.org

Column-heading abbreviations of modifier levels appear below. In the main table, the left-most column **LL** also specifies the physical key being described. For instance, where the **LL** entry shows **1**, that row describes all possible Live Keys that can be produced from the **1** key.

Heading	Description	Usual Case
LL	No modifiers	Lower
UU	Shift key only	Upper
CL	CC only	Lower
CU	CC + Shift	Upper
BL	BB only	Lower
BU	BB + Shift	Upper
AL	AA only	Lower
AU	AA + Shift	Upper
AB	AA + BB	Lower
BC	BB + CC	Upper
AC	AA + CC	*-- varies --*
ABC	AA + BB + CC	Lower
BCU	BB + CC + Shift	Upper

LL	UU	CL	CU	BL	BU	AL	AU	AB	BC	AC	ABC	BCU
`	~	nbsp	nnbsp	ə	Ə	à	À	ɨ	Ɨ	´	ɛ̃	Ɛ̃
0060	007E	00A0	202F	0259	018F	00E0	00C0	0268	0197	00B4	---	---
1	!	¡	¹	ā	Ā	ã	Ã	‼	¿	†	ɔ̃	Ɔ̃
0031	0021	00A1	00B9	0101	0100	00E3	00C3	203C	2E18	2020	---	---

2	@	¢	²	ɛ	Ɛ	ę	Ę	½	½	‡	∀	♮
0032	0040	00A2	00B2	025B	0190	1E1B	1E1A	00BD	00BD	2021	2200	266E
3	#	£	³	ē	Ē	ȁ	Ȁ	⅓	⅔	№	∃	♯
0033	0023	00A3	00B3	0113	0112	0201	0200	2153	2154	2116	2203	266F
4	$	€	· €	ʒ	Ʒ	δ	Δ	¼	¾	⩽	⌠	♩
0034	0024	20AC	---	0292	01B7	03B4	0394	00BC	00BE	2A7D	2320	2669
5	%	‰	℅	ǯ	Ǯ	ą	Ą	⅕	⅘	⩾	⌡	♬
0035	0025	2030	2105	01EF	01EE	0105	0104	2155	2158	2A7E	2321	266C
6	^	¬	√	ȳ	Ȳ	â	Â	⅙	⅚	≃	∩	♭
0036	005E	00AC	221A	0233	0232	00E2	00C2	2159	215A	2243	2229	266D
7	&	¥	∞	ū	Ū	ả	Ả	⅖	⅗	≅	∪	♫
0037	0026	00A5	221E	016B	016A	1EA3	1EA2	2156	2157	2245	222A	266B
8	*	§	×	ī	Ī	å	Å	⅛	⅞	≠	∝	♪
0038	002A	00A7	00D7	012B	012A	00E5	00C5	215B	215E	2249	221D	266A
9	(	¶	▪	ō	Ō	ȃ	Ȃ	⅜	⅝	≠	ë	Ë
0039	0028	00B6	2027	014D	014C	0203	0202	215C	215D	2262	---	---
0	)	ø	Ø	ǿ	Ǿ	ě	Ě	ɵ	Ɵ	∅	ö	Ö
0030	0029	00F8	00D8	01FF	01FE	0115	0114	0275	019F	2300	---	---
-	_	·	—	°	-	đ	Đ	SHY	•	–	⸗	⊕
002D	005F	00B7	2212	00B0	2011	0111	0110	00AD	2022	2013	2E40	2295
=	+	±	≡	≈	≠	ḡ	Ḡ	ʉ	Ʉ	—	⸗	QIK
003D	002B	00B1	2261	2248	2260	1E21	1E20	0289	0244	2014	2017	---
q	Q	æ	Æ	å	Å	ă	Ă	ẅ	Ẅ	⅘	q̄	Q̄
0071	0051	00E6	00C6	00E5	00C5	0103	0102	1E85	1E84	214D	---	---
w	W	ǽ	Ǽ	ǻ	Ǻ	ш	Ш	ŵ	Ŵ	₩	w̲	W̲
0077	0057	01FD	01FC	01FB	01FA	0448	0428	0175	0174	20A9	---	---

e	E	é	É	è	È	ë	Ë	ẽ	Ẽ	ᵉ	ę	Ę
0065	0045	00E9	00C9	00E8	00C8	00EB	00CB	1EBD	1EBC	1D49	---	---
r	R	ŕ	Ŕ	ŗ	Ŗ	ř	Ř	dz	Dz	DZ	ȓ	Ȓ
0072	0052	0155	0154	0157	0156	0159	0158	01F3	01F2	01F1	---	---
t	T	ŧ	Ŧ	ţ	Ţ	ť	Ť	ţ	Ţ	™	ŧ	Ŧ
0074	0054	0167	0166	021B	021A	0165	0164	0163	0162	2122	---	---
y	Y	ý	Ý	ỳ	Ỳ	ÿ	Ÿ	ỹ	Ỹ	¤	ȳ	Ȳ
0079	0059	00FD	00DD	1EF3	1EF2	00FF	0178	1EF9	1EF8	00A4	---	---
u	U	ú	Ú	ù	Ù	ü	Ü	ũ	Ũ	₫	ȕ	Ȕ
0075	0055	00FA	00DA	00F9	00D9	00FC	00DC	0169	0168	20AB	---	---
i	I	í	Í	ì	Ì	ï	Ï	ĩ	Ĩ	₹	ȉ	Ȉ
0069	0049	00ED	00CD	00EC	00CC	00EF	00CF	0129	0128	20B9	---	---
o	O	ó	Ó	ò	Ò	ö	Ö	õ	Õ	º	ȍ	Ȍ
006F	004F	00F3	00D3	00F2	00D2	00F6	00D6	00F5	00D5	00BA	---	---
p	P	œ	Œ	ů	Ů	ŭ	Ŭ	þ	Þ	₱	ȗ	Ȗ
0070	0050	0153	0152	016F	016E	016D	016C	00FE	00DE	20BD	---	---
[	{	‘	“	ė	Ė	ę	Ę	‹	— ·	‘	'	`
005B	007B	2018	201C	0117	0116	1E19	1E18	2039	---	02BB	2032	2035
]	}	’	”	ğ	Ğ	ă	Ă	›	— ·	'	″	‴
005D	007D	2019	201D	01E7	01E6	01CE	01CD	203A	---	02BC	2033	2036
\	|	¦	⋮	ġ	Ġ	ạ	Ạ	ĵ	Ĵ	ZWNJ	‴	⁗
005C	007C	00A6	205E	0121	0120	1EA1	1EA0	---	---	200C	2034	2037
a	A	á	Á	à	À	ä	Ä	ã	Ã	ª	ą	Ą
0061	0041	00E1	00C1	00E0	00C0	00E4	00C4	00E3	00C3	00AA	---	---
s	S	ś	Ś	ș	Ș	š	Š	ß	ẞ	ſ	ş	Ş
0073	0053	015B	015A	0219	0218	0161	0160	00DF	1E9E	017F	---	---

d	D	đ	Đ	ð	Ð	ď	Ď	dž	Dž	DŽ	d̄	D̄
0064	0044	0111	0110	00F0	00D0	010F	010E	01C6	01C5	01C4	---	---
f	F	ê	Ê	ę	Ę	ě	Ě	ę	Ę	ƒ	f̄	F̄
0066	0046	00EA	00CA	0119	0118	011B	011A	0229	0228	0192	---	---
g	G	â	Â	ą	Ą	ğ	Ğ	ǵ	Ǵ	'	ḡ	Ḡ
0067	0047	00E2	00C2	0105	0104	011F	011E	0123	0122	2032	---	---
h	H	û	Û	ų	Ų	ű	Ű	ħ	Ħ	″	ẖ	Ḫ
0068	0048	00FB	00DB	0173	0172	0171	0170	0127	0126	2033	---	---
j	J	î	Î	ị	Ị	ı	İ	ij	IJ	ǰ	j̄	J̄
006A	004A	00EE	00CE	012F	012E	0131	0130	0133	0132	---	---	---
k	K	ô	Ô	ǫ	Ǫ	ő	Ő	ḳ	Ḳ	ĸ	k̄	K̄
006B	004B	00F4	00D4	01EB	01EA	0151	0150	0137	0136	0138	---	---
l	L	Í	Ĺ	ḷ	Ḷ	ł	Ł	lj	Lj	LJ	l̄	L̄
006C	004C	013A	0139	013C	013B	0142	0141	01C9	01C8	01C7	---	---
;	:	‚	„	l·	L·	ẍ	Ẍ	ƀ	Ƀ	ˑ	n̈	N̈
003B	003A	201A	201E	0140	013F	1E8D	1E8C	0253	0181	02D0	---	---
'	"	‘	“	l′	L′	á	Á	ď	Ď	ʻ	(ɔ)	(Ɔ)
0027	0022	201B	201F	013E	013D	00E1	00C1	0257	018A	02BD	---	1F12F
z	Z	ź	Ź	ż	Ż	ž	Ž	ƶ	Ƶ	℠	z̄	Z̄
007A	005A	017A	0179	017C	017B	017E	017D	01B6	01B5	2120	---	---
x	X	ɣ	Ɣ	ş	Ş	ƀ	Ƀ	ẋ	Ẋ	®	x̲	X̲
0078	0058	0263	0194	015F	015E	0253	0181	1E8B	1E8A	00AE	---	---
c	C	ć	Ć	ç	Ç	č	Č	ċ	Ċ	©	c̲	C̲
0063	0043	0107	0106	00E7	00C7	010D	010C	010B	010A	00A9	---	---
v	V	ŷ	Ŷ	ɔ	Ɔ	ư	Ư	c’h	C’h	C’H	v̲	V̲
0076	0056	0177	0176	0254	0186	01B0	01AF	---	---	---	---	---

b	B	ń	Ń	ŋ	Ŋ	ơ	Ơ	ɲ	Ɲ	Ƀ	b̄	B̄
0062	0042	0144	0143	014B	014A	01A1	01A0	0272	019D	0243	---	---
n	N	ñ	Ñ	ṇ	Ṇ	ň	Ň	nj	Nj	NJ	n̄	N̄
006E	004E	00F1	00D1	0146	0145	0148	0147	01CC	01CB	01CA	---	---
m	M	µ	Ω	∑	∏	ɯ	Ɯ	↖	↘	♪	m̲	M̲
006D	004D	00B5	2126	2211	220F	026F	019C	2196	2198	266A	---	---
,	<	«	« ·	’	≤	ç	Ç	←	↑	« ·	⋘	∧
002C	003C	00AB	---	2019	2264	00E7	00C7	2190	2191	---	22D8	2227
.	>	»	· »	…	≥	ȧ	Ȧ	→	↓	· »	⋙	∨
002E	003E	00BB	---	2026	2265	0227	0226	2192	2193	---	22D9	2228
/	?	¿	÷	ʔ	⁄	ⱥ	Ⱥ	↗	↙	⁈	∫	∂
002F	003F	00BF	00F7	0294	2215	2C65	023A	2197	2199	203D	222B	2202

Dead Keys

This section describes the Q Keyboard **Dead Key** facility, which operates similar to other international keyboards.

Dead Keys on the Q Keyboard have additional features, most notably the ability to select an upper case letter using Early Shift or Late Shift, something traditional keyboards do not offer. See Capitalization rules for more information.

The keyboard also supports Held Keys, a variation on Dead Keys.

When either Dead Keys or Held Keys are used, there is only **one** accent per diacritic key, and both types of keys use the Q Keyboard's **AA** modifier key, instead of an **AltGr** key which is not present.

> In contrast, some international keyboards may have two, three or even four accent symbols appearing on a single key, such as the Finnish Multilingual keyboard.

The **AA** modifier is used for **Dead Keys**, ***Held Keys*** and **Live Keys**. When **AA** is held and the next key is a digit key, punctuation key, or any of the keys **W**, **X** or **M**, then **AA** is being used as a **Dead Key** or ***Held Key*** introducer. When **AA** is held and any *other* key is typed, **AA** is being used to type a **Live Key**.

The **BB** and **CC** modifiers are used to introduce **Live Key** letters. In addition, when **AA** is combined with **BB** or **CC**, the modifiers are also being used to type a **Live Key**. These combinations include the modifier chords **AB**, **BC**, **AC**, **ABC** and **BCU** and are described here. In a small number of cases, **BB** and **CC** are used for special **AL**/**BL** and **AL**/**CL** key sequences.

Introduction to Dead Keys

A **Dead Key** is a letter or symbol that requires a sequence of typed keys to produce. This sequence of keys must be typed in a specific order, and the keys cannot all be pressed at the same time. Dead keys are the standard method used in international keyboards to make extra characters available.

Unlike other keyboards, the Q Keyboard does not use an **AltGr** key or an enhanced **Ctrl** key to make additional letters available, but instead uses its unique modifiers **AA**, **BB** and **CC**. When you want to type a letter using a Dead Key, the **AA** modifier assumes the role played by **AltGr** on other keyboards. Modifier keys **BB** and **CC** are not used to introduce Dead Keys or Held Keys. In a small number of cases, **BB** and **CC** are used for special **AL**/**BL** and **AL**/**CL** key sequences.

> Even though the **AA** key is a repurposed **Alt** key, and **CC** is a repurposed **Ctrl** key, they do **not** function as ordinary **Alt** or **Ctrl** keys when used as **AA** and **CC** while running with the Q Keyboard software. Likewise, you cannot use the normal (unmodified) **Alt** key as an **AA** modifier to type Dead Key letters; you must use **AA**.
>
> One of your **Alt** keys acts as **AA** and one behaviors as a normal unmodified **Alt**. These two keys are not interchangeable. On current Q Keyboard designs, **AA** is the **left Alt** key, while the **right Alt** key retains its normal function.
>
> On a hardware-defined Q Keyboard, **AA** and **CC** are discrete physical keys, and are not repurposed from **Alt** and **Ctrl**.

Sometimes, the term "Dead Key" can refer to the "introducer sequence", such as the **AA+***grave* key combination used to type Grave Accented letters. Usually, "Dead Key" refers to the entire sequence used to produce an accented letter this way, such as **AA+***grave* followed by a data key like **E** to give the letter **è.** The term "Dead Key" in this documentation is never used to mean a single key *alone*, even though this expression is written as if it were singular.

For convenience, you will often see the term "Dead Key" used in a way that means the character that is produced by using a Dead Key sequence. For instance, the letter **è with Grave accent** is typed as Dead Key **AL ` E**. To be concise, we may refer to this as "**the Dead Key è**". This terminology is simply used to make explanations less wordy. To be even less wordy, sometimes the word "Key" is omitted, and we just say **Dead AL ` E** instead of **Dead Key AL ` E**.

When is it not clear from the context which is meant, we will use "Dead Key sequence" for the complete set of keys needed to type a given letter, and "Dead Key introducer" for all of the keys needed ***except*** the final letter key (like **E** in the example). That is,

- Dead Key ***sequence***: **AA ` E**

- Dead Key ***introducer***: **AA `**

Assigning diacritics to QWERTY keys

Some international keyboards have two, three or even four Dead Key diacritic symbols appearing on a single physical key. (An example of this is the Finnish Multilingual Keyboard.) For these devices, it may necessary to use some combination of AltGr, Shift and/or Ctrl to select the desired accent symbol.

> Such keyboards may allow one of the accents on a multi-accent key to act as a Dead Key in a "stand alone" manner, without requiring the use of AltGr or other modifier keys. You would then use Spacebar to obtain a literal accent symbol if needed. When a diacritic key is used in this way **on other keyboards**, we refer to this as an **Immediate Accent**.

In contrast, when a diacritic is associated with a key on the Q Keyboard, **that key has one and only one purpose as a Dead Key**. It is never used for multiple types of Dead Key accents. There is no such thing as an Immediate Accent on a Q Keyboard.

> Note: Because there are so many **combining modifier diacritic symbols**, many Dead Key diacritic keys represent *two* of such symbols. See the section on combining diacritic marks for more information.
>
> When a Dead Key has two combining symbols associated with it, the one you are likely to need most often is termed the **Primary Combining Modifier**, and is typed as a ***Held Key*** sequence. When that key has another, related accent, it is termed the **Secondary Combining Modifier**, and is typed as a **Dead Key** sequence.
>
> > For instance, the **Ring Above Combining Modifier** is typed as ***Held AL 8 8***, while the **Ring Below Combining Modifier** is typed as **Dead AL 8 8**.
>
> Combining symbols are a separate feature, and are not strictly part of Dead Key usage as such. Additionally, some letters with alternative or dual diacritics are produced as ***Held Keys***. See the section on Held Keys for more information. These special features do not change the general rule stated above.

Consider the upper-most left data key on the U.S. QWERTY, which is the **accent/tilde** key.

Without knowing better, one might assume that this key was used for both grave-accent and tilde-accent letters, but that is not the case. **This key is used only for grave accent Dead Key letters**. For tilde, you must use the **one/exclamation** key to its right, the *neighbor key* of the accent/tilde. **AA 1** is the Dead Key introducer for Tilde letters, not the accent/tilde key.

Wouldn't it have been easier to explain and remember if the accent/tilde key were somehow involved in producing Tilde Dead Key letters also? Possibly. So why wasn't it done that way?

- There are very few other keys with two punctuation marks like this one, where both could potentially be used as Dead Key symbols in a way that made any sense. That is not enough to justify making a special case out of this one particular key. By using this key for only one purpose instead of two, and by having all of the diacritic keys likewise be used only one way, we are being consistent, and there is less for a typist to learn. There is only one way to use keys like this, not two or more ways. If the accent/tilde key were used in an inconsistent way, some characters on it currently would have to be moved, and key 1 would also have to be changed. The result would be confusing, hard to understand and hard to document.

- As discussed in Capitalization rules, the keyboard uses Shift to control the case of the final letter being produced. It does not use it to select from among multiple diacritic types. Because of that, it's not possible to use the Shift for both purposes. The way that Shift is currently handled was deemed more useful and more important than trying to use the accent/tilde key for two different diacritic types. In addition, testing showed that involving Shift in accents can lead to fatigue if many letters need to be accented. It is desirable to avoid the use of Shift where possible, unless it actually involves a letter with an upper-case form.

- Because a standard, unmodified QWERTY keyboard has no Dead Key diacritic accents of its own, none of the keys have printed legends with accents on the keycaps, other than the standard QWERTY letters and symbols. Limiting Dead Key diacritics to one per key helps keep things simple, since you only have to remember one diacritic type per key instead of (potentially) several of them. (A hardware-defined keyboard would have printed keycap legends for the Dead Key accents, but these would be in the same locations.)

- Additionally, many of the diacritic key positions were chosen such that the standard QWERTY symbols that **are** there are a fairly good reminder of their extended Q Keyboard functions. For instance, the key with the **:** colon is used as a ¨ diaeresis accent, and the key with the **)** right parenthesis is used for the ˘ breve accent. These symbols, when turned clockwise 90 degrees, closely resemble the diacritics they support. This "trick" helps you to remember which key does what. It is a "trick" that wouldn't work if more than one accent were assigned to the same key.

- By having the accent/tilde key be used for the Grave accent, this is also consistent with other key that have two punctuation marks. In nearly all cases, it is the **lower** symbol on the key that is used for the Dead Key accent. (The one key that is not consistent in that way is the **; :** key, but that should not cause any confusion, since there is no accent that looks like a turned semicolon.)

- Finally, the Grave dead key and the two Tilde dead keys (Key 1 for Tilde Above, and Key 2 for Tilde Below) may not be extensively needed. Except for some specialty letters and a few dual-diacritics, all Latin letters with Tilde Above and Grave have **Live Keys**, except for **ṽ Ṽ**, **ǹ Ǹ** and **ẁ Ẁ**. There are no live keys for Tilde Below or Middle Tilde letters,

but these are mostly used by linguists rather than in everyday languages. Because of that, the Grave and Tilde letters you type most often won't use these keys, so even if some aspect of them were not the most convenient, it shouldn't be a cause of concern.

Why was the accent/tilde key chosen for the Grave accent, and Key 1 chosen for the Tilde accent, rather than the other way around? Across all languages, Grave accent is used overall far more than Tilde. The choice was made to place the accent used most (Grave) on the key that was easiest to reach quickly, which between the two of them is the accent/tilde key. As with other design choices, the goal is to provide the most benefit to the most people.

The accent vs. tilde issue is also discussed here.

List of diacritic assignments

On the Q Keyboard, every digit key and every key with two punctuation marks is used as a Dead Key diacritic. There are also three letter keys, **W**, **X** and **M** used as Dead Keys. These all require use of the **AA** modifier, plus an optional Shift key.

Here is the complete list. The information that appears below is a summary of the detailed descriptions that appear in the Dead Key Guide. To save space, not every Extended Purpose of each key is listed. See individual Guides for more information.

When Dead Key diacritic keys are used as **Primary combining modifiers**, they are typed the same way as ***Held Keys*** are. You must hold **AA** while typing the given dead key **twice**. So, to add a Ring Above accent to the letter **o** using a combining modifier, you would do the following, noting that the **8** key is used as the Ring Accent diacritic key:

- Type the letter **o**
- Hold the **AA** key
- Type the **8** key **twice**
- The letter now has **ǒ** with the Ring Above accent added
- Release the **AA** key

When Dead Key diacritic keys are used as **Secondary combining modifiers**, they are typed the same way as **Dead Keys** are. You must hold **AA** while typing the dead key once, then release **AA** and type the dead key a second time. So, to add a Ring Below accent to the letter **o** using a combining modifier, you would do the following, again noting that the **8** key is used as the Ring Accent diacritic key:

- Type the letter **o**
- Hold the **AA** key
- Type the **8** key once
- Release the **AA** key
- Type the **8** key again
- The letter now has **ọ** with the Ring Below accent added

You may notice that combining modifiers on some keys are ***paired***. So, there is a Circumflex Above and Circumflex Below on key 6, while there is a Circumflex Below and Circumflex Above on key [1A. This was done as a convenience, so you could choose the key that was easiest to reach at the time you needed it.

When a Combining accent symbol is shown as **n/a** it means there is no symbol available. There are often other combining symbols available on that dead key, which are produced with different key sequences. Consult the given Dead Key Guide for more information.

Some combining symbols are present in few fonts, such as Ogonek Above, since there are no precomposed letters having this accent. (One font that does a good job with both

Ogonek Above and Below is called **Cardo**.)

LC Key	UC Key	Primary Purpose	Extended Purpose	Primary Combining Accent		Secondary Combining Accent	
`	~	Grave accent	Dual-accented letters with grave accent	Grave above	ȍ	Grave below	ọ̀
1	!	Tilde above, TopBar	Dual-accented letters with Tilde Above	Tilde above	ọ̃	Tilde below	ọ̰
2	@	Tilde Below, Middle Tilde	Selected Math symbols	Tilde below	ọ̰	Middle tilde	ọ̽
3	#	Double Acute and Grave	Box Drawing symbols, Misc. Punctuation	Double acute	ọ̋	Double grave	ọ̏
4	$	Greek	Greek with Tonos accent	Dialytika Tonos	ọ̈	n/a, Dead key produces ¤	
5	%	Ogonek, Descender	Greek with Dialytika	Ogonek below	ǫ	Ogonek above	ȯ
6	^	Circumflex above, Cyrillic	Greek with Dialytika and Tonos	Circumflex above	ô	Circumflex below	ọ̭
7	&	Hook above	Generic Hook letters	Hook above	ỏ	n/a key produces 7	
8	*	Ring above, Ring below	Half-Ring diacritics	Ring above	ọ̊	Ring below	ọ̥
9	(	Inverted breve	Glottal stop symbols	Inverted breve above	ȏ	Inverted breve below	ọ̯
0	)	Breve above, H with Breve below	Letters with Palatal and Retroflex hooks	Breve above	ọ̆	Breve below	ọ̮
-	_	Dash Stroke	Additional dash stroke letters	Short stroke overlay	ɵ	Long stroke overlay	ɵ
=	+	Macron, Line below	Dual diacritic letters with Macron	Macron	ọ̄	Macron Below	ọ̱
w	W	Cyrillic	n/a	n/a		n/a	
[	{	Circumflex below	Superscripts, currency symbols	Circumflex below	ọ̭	Circumflex above	ô
]	}	Caron above	Subscripts, currency symbols	Caron above	ọ̌	Caron below	ọ̬
\	|	Dot below	Dual diacritic letters with Dot below	Dot below	ọ̣	Long Vertical Line Overlay	ɸ
;	:	Diaeresis above	Dual diacritic letters with Diaeresis above	Diaeresis above	ọ̈	Diaeresis below	ọ̤
'	"	Acute above	Dual diacritic letters with Acute above	Acute above	ọ́	Acute below	ọ̗
x	X	Extra letters	Small capitals	n/a		n/a	
m	M	Miscellaneous letters and symbols	Modifier letters	n/a		n/a	

,	<	Cedilla and Comma Below	Dual diacritic letters with Cedilla	Cedilla below	ǫ	Comma below	ǫ
.	>	Dot above	Dual diacritic letters with Dot above	Dot above	ȯ	Dot below	ọ
/	?	Slash stroke	Dual diacritic letters with Slash stroke	Long solidus overlay	ɸ	Short solidus overlay	ø

Dead Key codes and typing errors

Conventional operation of Dead Keys

All keyboards that support Dead Keys operate basically the same way. An introductory character signals the start of a Dead Key sequence. The keyboard waits for a second key to be typed. When it is, the keyboard software uses a lookup table to determine how the second character is to be interpreted. Thus, **typing Dead Key letters is a two-stage process**, where the introductory sequence and the final letter must be typed separately.

For instance, a keyboard may use **AltGr**+*grave* to mean a grave-accent Dead Key sequence has begun. It then waits for a key to be typed. Suppose that is the "**e**" key. The keyboard software will look up in an "grave-accent dead key table" how a plain **"e"** is to be translated when a grave-accent Dead Key is active. It finds the Unicode value for **è** with Grave Accent in the table (with happens to be **U+00E8**), and that is what is produced. There is a separate table for every kind of accent.

If you had wanted an upper-case **"È"** instead, a conventional keyboard requires you to hold the Shift **after** the AltGr+*grave* is released, but **before** the **E** key is pressed. Handling the **Shift** in this way is described in this documentation as "**Late Shift**" mode.

Because of how this works, a conventional keyboard has just one "grave-accent mode", independent of the shift state of the final letter, and one "grave-accent table". The Q Keyboard will operate correctly if you use it this way, since its design is compatible with conventional Dead Key usage on other keyboards.

Early Shift operation of Dead Keys on the Q Keyboard

The Q Keyboard also supports **Early Shift** for Dead Keys. (See Capitalization rules for an in-depth discussion of this topic.)

Early Shift does not require you to hold the Shift key afterwards (as Late Shift does), so it must somehow convey the shift state from "stage one" to "stage two" of the Dead Key typing process.

To do that, there are **two** modes involved for each accent. For instance, referring to the example above, when using Early Shift there is both a "**lower-case grave-accent mode**" and an "**upper-case grave-accent mode**".

To keep track of its diacritics, a conventional keyboard might use a single grave-accent character as a "Dead Key code", but the Q Keyboard requires **two** internal codes for each accent. We could have used any two arbitrary values, but that would have been hard to understand. Because there are generally not two kinds of Unicode characters available for this purpose (like, two different kinds of grave accent characters), another means is

needed.

Representative letters as internal Dead Keys codes

The method used by the Q Keyboard to define Dead Keys is to select **representative letters** as internal codes, rather than using bare diacritic marks.

For instance, the "grave-accent Dead Key mode" is internally represented by **two codes**, which are **à** and **À**. When you type **AA**+*grave*, the **à** code is generated, and **AA**+**Shift**+*grave* generates **À**.

Because these characters define internal Dead Key ***codes*** and not actual ***letters***, you don't see them right away, even though their data values happen to be encoded as displayable letters. The **AA** modifier tells the keyboard that they are **not** the final characters to be produced, but are "flags", which indicate some kind of lower-case or upper-case grave-accent letter is expected to appear next as the final key. Since there are two codes instead of one, the keyboard has two independent lookup tables to resolve the final key. When you **then** type that second letter, the correct table is checked, the letter is transformed as needed and gets displayed.

> What is described above sounds complicated. Can you really rely on it to work properly? Yes. It would be difficult to manually create and synchronize these Dead Key lookup tables and define their technical details in a guaranteed error-free way, and for that reason it's **not** done manually. Specially designed software lends a hand to create these tables, and it has been tested very thoroughly. In the course of over three years of continuous validation, this Dead Key system has never failed. You can be confident that everything will work as advertised.

Most of the representative letters are some kind of accented form of the letter **A**. In a few cases, other letters are chosen when **A** is not available or if using it would result in a technical conflict. For instance, there is no such letter as A with Tilde Below, so the representative letters for Dead Key 2 are **Ḕ** and **ḕ** with Tilde Below instead.

Dealing with representative Dead Keys codes during typing errors

All keyboards with Dead Keys operate on the same principle. They are "state machines", where there is a "normal state", a "Dead Key introductory state" and a "Dead Key final state". Once the final key is typed (like **E** in the example above), the keyboard returns to its normal state.

When the keyboard is in the "Dead Key introductory state" it is waiting for the final character, so it can look it up in the appropriate table. If the key you type is not in the table, it is an "undefined Dead Key".

For instance, if you type **AA**+*grave*, that is the Dead Key introducer for the grave-accent mode. If you then type **E** key, you will get **è** or **È** depending on whether the Shift was used.

However, there is no such letter as **Q** with grave accent defined in Unicode. If you try to make one anyway, the keyboard software will detect an "undefined Dead Key state".

> To be more precise, there are no **dead key symbols** defined in the Q Keyboard for **AA ` Q**. That is not quite the same thing as saying there is no **letter** Q with Grave (which also happens to be true). For instance, there is no such thing as a **digit 2 with Grave** either, but the keyboard defines **AL ` 2** as the **√** square root symbol. To support the many characters that are present on the Q Keyboard, it is necessary to use Dead Keys for a wide variety of purposes that go beyond their primary role of producing letters with accents of a certain type.
>
> In case you were curious, most fonts will not allow you to do "crazy" things like trying to add a Grave Accent to the digit 2. The reason this won't work is that font designers omit the necessary font attributes for symbols like digits because they don't expect users to add accents to them. If you tried to apply a Combining Diacritic to a symbol like a digit anyway, there may be no officially defined place for the accent to go. It may end up being placed in some peculiar location, or it may not show up at all. There are a few fonts that were specially designed for linguists and for an international audience, in which you ***can*** do "crazy" things. One such font is Gentium Plus.

Dead Key Junk

When an undefined Dead Key state is detected, the keyboard will produce the representative Dead Key code in effect at the time, plus the letter you just typed. In this case, trying to type **Q** with grave accent will result in **àq** or **Àq** or possibly **àQ** or **ÀQ** instead of the desired result. When you see something like this, you know that the letter you typed does not exist with that kind of accent in Unicode, and that the keyboard does not define this key for any ***other*** purpose. Either you misunderstood what kinds of accents were available, or you just typed the wrong letter. The two characters you see are termed "**Dead Key Junk**".

> This behavior is typical for how Dead Key keyboards operate. In Windows (and many other systems) the behavior is defined by the operating system itself, and cannot be changed. The software provided by the Q Keyboard as a "device driver" actually consists of a large data table without any significant executable logic. It is not as though the author "wrote the program wrong", because there ***is*** no program - only a data table. This table is read and interpreted by Windows itself, whose predefined logic exists within the internals of Windows and is not subject to external modification by independent software providers.

If you typed the wrong letter, just backspace over this "junk" and try again. If you really wanted a letter that is not defined with the accent you need, you can add a combining

diacritic to a "plain" letter. The letter **q** with grave accent looks like **ǫ̀** when typed that way. See the section on combining diacritics for more information.

Is the standard system method of handling "Dead Key Junk" reasonable?

To those unfamiliar with Dead Key-based keyboards, it might seem odd and unfortunate that host systems would intentionally give you these junk characters when an undefined key is typed - seeing that the results are of no use. Why was it done this way? If it's undefined, why doesn't it just produce **nothing** instead?

On some international keyboards, certain keys like a plain accent might always be assumed to be Dead Key introducers - even without using **AltGr** - unless some action is taken to "disprove" that assumption.

> This documentation refers to such **assumed** dead key accents as **Immediate Accent** keys.

One way to "disprove" that assumption is to type the Spacebar, in order to convert the introductory Dead Key into an accent symbol of some kind. That is how you type a literal accent on such a keyboard. Another way to disprove the assumption is to type a key that never takes an accent, such as a digit. When that happens, both the accent and the digit are produced as-is. In this case, that result is not "junk" at all, but is exactly what you wanted.

To take advantage of situations like this, the typist would have to remember all the possible combinations where the accent did or did not apply to the following key. If it **did** apply, but you didn't want it to, you'd have to type a Space first. That involves remembering a number of special cases. But, typists using such international keyboard systems have doubtless had years of practice to learn and remember this. (It may likely be the only keyboard they used their entire lives, so they would have a long time to learn all of it.) And, if the most frequent use for an accent was as a diacritic mark and seldom as a literal, you'd usually only need to type a single key, which is efficient. So **no**, the designers of such keyboards weren't 'crazy' and didn't do it 'wrong'. They were simply solving a different problem for different kinds of devices.

In contrast, the Q Keyboard does not have any such special cases, since it has no Immediate Accent keys. This is a necessary requirement, because when the Q Keyboard is not being used for its extended purposes, it must function **exactly** like a U.S. QWERTY, and on such devices, ordinary keys are never assumed to introduce a Dead Key sequence. In order to maintain total U.S. QWERTY compatibility, we must always use the **AA** modifier key **first** to get a Dead Key symbol. We cannot support Immediate Accents.

Because the Q Keyboard software runs on Windows, and because the Windows keyboard architecture complies with traditional Dead Key keyboards (and it has no knowledge of the Q Keyboard's different approach), we are stuck with these junk characters showing up

now and then. We just have to live with it, and type as carefully as we can.

Would it have been better if traditional keyboards did not produce "junk" characters?

Suppose you wanted a **ù** with grave accent, but when you went to type accent+**U**, you actually typed the digit **8** by mistake instead of **U** since it's near **U**, and you were careless in typing. Assume that this is an undefined key. If the keyboard did **not** produce "junk" like **`8** you would have just finished typing two keys, **and gotten nothing in return**. The Dead Key sequence would have seemingly left the keyboard **still dead**. That could be very confusing, and a typist might not be sure of what to do next.

So, the way things work now is just about as good as we can make it.

Wishful thinking from the author about Dead Keys

The author wishes Dead Keys worked differently. How so?

Well, suppose instead of creating Dead Key Junk, assume that the host system's keyboard manager generated the Dead Key **after** the base key, instead of **before** it, when an entry is "not found". Further, imagine that every Dead Key were implemented as a combining modifier. Let's take Diaeresis as an example.

- For letter **a**, there is a Diaeresis form, which would be found in the Dead Key table. The letter **ä** gets produced as usual.

- For letter **n**, there is no Diaeresis form found in the Dead Key table. Instead, letter **n** is output as-is, followed by a ¨ Diaeresis combining modifier, which would be merged as usual, resulting in **n̈** produced.

If keyboards worked this way, Dead Key Junk would appear less often, and the keyboard would be **much** easier to use. Typists would no longer have to distinguish between precomposed letters and ones that got combined. Unfortunately, they **don't** work this way.

Further, it would be helpful if strings of characters (digraphs or longer) could be assigned to **Dead Keys**. Currently, only **Live Keys** can contain digraph definitions, due to a limitation in the keyboard device driver architecture. Supporting digraphs on Dead Keys would make possible more powerful keyboard designs.

Changes like this would require some significant software design by manufacturers, but are certainly within the realm of possibility. One can only hope that keyboard technology will improve in the future ...

Potential Dead Key enhancements

Could currently undefined Dead Key positions in the Q Keyboard be filled-in with additional useful characters?

That is a good question, and the short answer is that it's **possible** (within limits), but not too many more can be added.

Right now, nearly every useful Latin character that could possibly be incorporated has already been included in the Q Keyboard. The official Unicode character lists were studied extremely closely, and three different language validation lists were consulted during the development of the keyboard. One list had some 70 languages, one had 140 languages and one had 550. And, a comprehensive list appearing on the Omniglot web site had 880 different alphabets. Every letter in every language, in all of these lists, is available on the keyboard, either as a **Live Key**, a **Dead Key**, a ***Held Key***, or with a combining diacritic in cases where Unicode does not define a discrete precomposed letter. No known requirements of any of these languages were left out, if there were any possible way of supporting them.

> A tiny number of letters are not supported, because they don't exist in Unicode and can't be created using combining symbols. For such letters, **no** keyboard could resolve such problems. It would require a revision of the Unicode Standard and updated fonts from font vendors. The Unicode standard **does** get revised periodically, about once a year, and the Q Keyboard reflects the most recent revision. For instance, the as-yet to be released June 2018 standard defines Latin Letter U with Slash Stroke. The Q Keyboard already incorporates a definition for this.

Besides the steps performed above, an exhaustive cross-check of every defined Unicode letter was made, to ensure that no genuinely useful letters were getting ignored or skipped by accident, even if specific usage examples had not been found. That analysis did result in a few new characters being added to the Q Keyboard's repertoire that otherwise might have not been considered. Thus, over 2400 characters are available, either as **Live Keys**, **Dead Keys** or ***Held Keys***. See Q Keyboard statistics for more precise numbers.

You should find that any Latin letters in the Unicode standard that are not available on the Q Keyboard are ones that are not generally in active use.

Some archaic letters or alphabets for languages that no longer have living speakers are not fully covered, and other Latin letters have been omitted because no examples of current usage could be found. With respect to modern, contemporary Latin-based languages, these are **very** well supported. There really isn't much left to add that anyone is likely to need, keeping in mind that the primary purpose of the keyboard is to type **Latin** letters, and not letters for other kinds of scripts.

> There happens to be a large number of "Latin" symbols that are modifier letters or

combining modifier letters. Based on available reference materials, most of these symbols are only used by linguists and do not appear in everyday alphabets.

While the author has no issue *per se* in supporting linguists, the sheer volume of all these specialized symbols makes it impossible to incorporate them all into the Q Keyboard. There just isn't enough room to hold them in memory. And, categorizing them and assigning key locations for them in a way that made sense and were easy to use and remember would be difficult. Still, if a linguist could cite a particular phonetic symbol they really needed that had not been included, it would be considered. Users with such interests are invited to contact the author.

Because the keyboard has certain redundant key assignments, some of the less-important redundancies could possibly be removed to make extra room for something else if necessary.

There are also some non-redundant characters that, nonetheless, are admittedly of limited use and might not be missed if removed. Among such are a number of lesser-used math symbols. Deleting some of these could make room for other letters deemed more important. This would have to be considered on a case-by-case basis, as new requirements emerged over time.

The main issue is that there is a memory-size limitation as to how large a Windows keyboard device driver can be, and the Q Keyboard is getting close to that limit. While there **is** still a small amount of room left to add new letters, that remaining space must be carefully budgeted. That rules out adding whole new alphabets or large numbers of math and arrow symbols, but adding some new individual characters is still possible, if they would be of general interest to most users.

Another limiting factor is that many of the Dead Keys are getting full. None of them remain where an entire range of letters A-Z with some kind of accent remain unassigned. There aren't any existing Latin letter groups that have been overlooked in that way, but supposing there were, it would not be easy to find a "home" for all of them.

By relocating some Live Key letters, it is **possible** to add more Dead Key locations. Based on the current design, it is conceivable that keys Q and P could be turned into dead keys. Key G was once the Greek dead key in an earlier design. These are simply possibilities. No promise is given that such changes will be made, only that they could be.

If a convincing case can be made for some particular change, all well thought-out ideas will be considered. See the beginning of this Help for contact information if you have any suggestions on this or any other issue about the Q Keyboard.

Literal symbols

Some keyboards that support Dead Keys use the convention that certain accent keys **always** mean a Dead Key diacritic, even without using an **AltGr** key. So, when you want the actual symbol itself, you must press the Spacebar afterwards to obtain it.

> The Q Keyboard supports the use of Spacebar to produce a Dead Key's **Primary Literal**. To produce a **Secondary Literal** on certain Dead Keys requires use of an **AL/BL key sequence**. This is discussed below.

For instance, **another** keyboard might define a plain Grave Accent key as always being a Dead Key diacritic, and when you need a grave accent **character**, you must type the accent key and then the Spacebar.

- When a "bare" diacritic character is produced this way, we call it a **Literal** character. In this example, an accent key followed by a Spacebar would result in a **literal** grave accent character. Another way of describing this is to say that a bare diacritic is an isolated punctuation-like mark that is not attached to a base letter. Most people (other than linguists) will seldom require the use of bare diacritic Literals.

- When **other** keyboards define an accent key that does not require an AltGr, Ctrl, Shift or other modifiers to be used, we call it an **Immediate Accent key**. International keyboards generally do not have more than two or three of such Immediate Accent keys, because they require dedicated keys, and such keys are in short supply, being needed for other purposes as well. For instance, the well-equipped German T2 keyboard (a very comprehensive layout having many supported dead keys) has only **two** Immediate Accent keys, as the term is defined here.

The Q Keyboard allows you to type literal accent symbols. To maintain compatibility with standard U.S. QWERTY usage, "simple" keys alone are never treated as Dead Keys by themselves. **The Q Keyboard has no Immediate Accent keys**. Because of this, you must always use the **AA** modifier to type Dead Key accented letters. Thus, the accent key alone is always just an accent **character**. But, if you type the **AA** modifier and an accent Dead Key introducer, and then a Space, you will get the Primary literal grave-accent **symbol**.

For instance, the diaeresis Dead Key introducer is the **AA** key plus the colon/semicolon key. If you followed this by a letter like **E**, the accented letter **ë** will appear. If you type a Space instead of **E**, a bare diaeresis literal symbol of ¨ will appear instead.

> **The Q Keyboard never changes the behavior of the Spacebar**. No matter what combination of modifier keys or Shift keys that might be held down while the Spacebar is being pressed, it **always** produces an ordinary Space. Unlike some other international keyboards, the Q Keyboard does **not** produce special space characters like Non-Breaking Space with the Spacebar. See Spacing and joining symbols for more information on how to do this.

Thus, if you wish to type a Primary literal accent, it doesn't matter whether the **AA** key is released or not when the Spacebar is used.

You may find that a literal accent **symbol** is different from a stand-alone **character** of the same type, since **they are different Unicode values**. For instance, a tilde **Literal Symbol** is **˜** while an ASCII tilde **character** is **~** which is larger and sits lower than the literal symbol. In Unicode terminology, a literal accent symbol is known as a "Modifier Letter".

A conventional international keyboard might not make a distinction between an accent **character** and an accent **symbol**, since it doesn't have to - and might not be able to. However, because the Q Keyboard uses ***representative characters*** and not literal accent symbols to denote Dead Keys, it has no need to equate these two concepts. That is actually a good thing. It give the Q Keyboard (and thus, *you*) the flexibility to produce both kinds of symbols when they don't happen to be the same character - and they are frequently **not** the same. That makes the Q Keyboard more powerful than a conventional Dead Key keyboard.

Even though these literal symbols are not "letters" as we would ordinarily understand the word, that's how they are described in the Unicode standard, to distinguish them from "combining" symbols. A Modifier Letter does not get combined with other letters, but stands alone as a separate symbol. Another way of saying this is that a Modifier Letter advances the cursor after being typed, while a combining symbol does **not** advance the cursor. Since a literal character will advance the cursor, it takes up "space" on a line. For that reason, these literal characters are termed **spacing modifiers** by Unicode.

Literals are seldom needed, but are present on the Q Keyboard for completeness and compatibility with conventional keyboard usage, because some users might expect them to be available. In contrast, Combining Diacritics can be very useful. These are discussed in the next section.

Bare diacritics are mostly just "artifacts" of how Dead Key systems work on a typical keyboard. They are present because the internal operation of such keyboards requires them, not because the average user has any great need to type bare diacritic literals.

Two diacritic literal symbols that might be somewhat useful are the grave accent and acute accent, which appear as ` and ´ when typed. These could be used as a type of opening and closing quotes.

Secondary Literals and **AL/BL** key sequences

Each Dead Key on the Q Keyboard serves only one "dead key purpose". For instance, key **08** is the Ring Above dead key. But for combining accents and literals, many dead keys have two purposes. In the case of **Ring**, there is a combining modifier for **Ring Above** on

Held AL 8 8, and a combining modifier for **Ring Below** on **Dead AL 8 8**.

Likewise, there are symbols in Unicode that can be used as *Literals* for both of these. For the **Primary Literal**, there is ˚ **U+02DA Ring Above**, and for the **Secondary Literal** there is ˲ **U+02F3 Modifier Letter Low Ring**.

For a Primary Literal, the Q Keyboard works like other international keyboards, in which you press Spacebar after the dead key to get the symbol. But how can we get the Secondary Literal?

The Spacebar can't be used, even with Shift or any of the Q Keyboard modifiers, because Spacebar **only** produces spaces, as discussed above. We can't consistently choose some **other** key to trigger the Secondary Literal either, because there is a good chance any key we might want to pick would already be in use for something else. It's possible to make the Secondary Literal require a shifted ***Held Key*** sequence, but in testing this approach, it was found to be awkward and tiring with repeated use.

The method chosen to type Secondary Literals is that you first type the Dead Key introducer using AL, then release these keys, and holding BL, type the Dead Key character a second time. This technique does not use or require Shift. It is admittedly a novel approach, but it works well, does not require a lot of typing effort, and is easy to do with a little practice.

Example: To produce **U+02F3 Modifier Letter Low Ring:**
- hold **AL** and type the **8** key
- release all keys
- hold **BL** and type the **8** key a second time
- the Modifier Letter Low Ring ˲ appears
- release all keys

The process of holding **AL**, and then **BL**, is called an **AL/BL key sequence**.

In key lists, an **AL/BL** key sequence is shown (using the example above) as **AL 8 BL 8** in black and green.

Secondary Literals are not present on all dead keys. Check the Dead Key Guide for the keys you are interested in.

There are also keys that use a special **AL/CL** key sequence. See Understanding modifier key notation for more information about **AL/BL** and **AL/CL** key sequences.

Not all Dead Key diacritic positions have combining modifiers or literals

In a few cases, some Dead Keys don't produce any literals or combining symbols. These keys will create Dead Key Junk if typed. For instance, **AL /** is used for letters like **ą** with

Slash Stroke, and **AL / /** is used for a combining Slash symbol. There is no corresponding **shifted** version of this accent, and nothing else seemed appropriate to assign there.

Handling of undefined literals

The Unicode standard does not define Modifier Letters for all diacritics, not even for all of the most commonly-used ones. In some cases, the Q Keyboard uses another Modifier Letter instead that resembles the desired mark, even if it's not identical to it. For instance, there is no Modifier Letter for the diacritic used as a Double Grave Above or Double Acute Above, but ones exist where the doubled symbol is in the middle position. These are close to the desired symbols, and it's the best we can do, so that is what appears.

In other cases, there is no character that is even close to what is needed. If this happens, and there is some literal you really need, you can apply a combining diacritic to a space. That will create a more-accurate representation of the literal, but it also comprises two character values instead of one, which are the space and the combining symbol that follows it.

Held Keys

This section describes the Q Keyboard ***Held Key*** facility. A Held Key is a variation on Dead Key usage.

By *holding* the **AA** modifier key throughout a Dead Key-like sequence, it doubles the number of possible key sequences that can be defined. This increases the keyboard's flexibility, without the need to add additional modifiers or Dead Key introducers.

Introduction to Held Keys

As noted previously, a **Dead Key** is a letter or symbol that requires a sequence of typed keys to produce. This sequence of keys must be typed in a specific order, and the keys cannot all be pressed at the same time.

A Held Key is a special type of Dead Key. A Held Key differs from a Dead Key by the order in which keys are held and released.

Consider the letter **å with Ring Above**. This can be produced with a **Dead Key** sequence as follows:

1. Press and hold the **AA** modifier key
2. Type the **8** key
3. Release the **AA** key
4. Type the **A** key
5. The letter **å with Ring Above** appears

Here, the **AA** key was released ***before*** the **A** key is typed.

Now, note what happens when **AA** is **held** until ***after*** the end of the sequence:

1. Press and **continue to hold** the **AA** modifier key
2. Type the **8** key
3. Type the **A** key
4. The letter **ạ with Ring Below** appears
5. **Now** release the **AA** key

When AA is held *through the entire key sequence*, the character produced is referred to as a ***Held Key***.

Held Key notation

To distinguish a ***Held Key*** from a **Dead Key**, the documentation draws attention to this by showing the Held Key sequence in ***red italics***.

In the example above:

- The **Dead Key** for **å** is described as **AL 8 A**
- The ***Held Key*** for **ạ** is described as ***AL 8 A***

Using Shift with Held Keys

Unlike a Dead Key letter, **Held Keys do not respect the Caps Lock**. See Capitalization rules for more information.

The main thing to remember is that upper-case ***Held Keys*** require you to **hold the Shift key for the entire key sequence**. You must hold AA and Shift **together**, and release them **together**.

For example, ***AU 3 L*** has the ligature **ffl**.

Notice how this key is described as ***AU 3 L*** in red italics. This tells you two things:
- The red italics identify this as a Held Key symbol
- The ***AU*** tells you that you must hold both **AA** and Shift at the same time, and release them at the same time.

To type ***AU 3 L*** you would perform the following steps:

1. Press and **continue to hold** the **AA** key and the Shift key
2. Type the **3** key
3. Type the **L** key; the **ffl** ligature appears
4. Release all keys

Why are Held Keys used?

Some types of diacritics are used so infrequently that it doesn't make sense to set aside a dedicated Dead Key location **just for them**. In the example above, there is only one Unicode letter with **Ring Below**, and **ạ Ạ** is it. Since the Ring Above diacritic mark is in a different location, but has the same "ring shape", it is fitting to somehow associate these letters together. However, there is already a letter **å Å** associated with the **A** key. We could put the Ring Below letter on some other *neighbor key*, but it is always preferable to have a letter in its native location. We really want "**A-type**" letters on the **A** key, if there is any possible way to do it.

Held Keys allow us to assign many lesser-used, specialty, or one-of-a-kind symbols to the *native key* where they belong. They are also the mechanism used to support **dual-diacritics**, both for Vietnamese letters and certain others.

Here are examples of "one of a kind" letters handled as ***Held Keys***:
- There is one letter **ṵ** with **Diaeresis Below**. Letter **ü** is a **Dead Key** and **ṵ** is a ***Held Key*** on ***AL : U***.
- There is one letter **ṩ** with **Dot Above and Below**. Letter **ṣ** is a **Dead Key** and **ṩ** is a ***Held Key*** on ***AL \ S***.

Additionally, some Dead Key groups have so many symbols assigned to them that Held Keys are the only way to accommodate everything. With 47 possible data keys following a Dead Key, times 2 Shift states, there are 94 possible characters that could be assigned for

a given Dead Key. But some Dead Keys have more than 94 possibilities. **AA M** is an example, as it contains a large number of Miscellaneous symbols and Modifier Letters. Without Held Keys, it would not be possible to fit everything in. And, even if all the symbols could have been made to "fit", it might have only been possible to do it if some letters were located in unusual places that you wouldn't remember, such as on digits, punctuation or completely unrelated letter keys. Similar remarks also apply to support for Cyrillic, which would not have been possible without Held Keys. The Held Key approach really is a better way to do things.

Could the Q Keyboard have used Chained Dead Keys instead?

Some creators of advanced keyboards designs use a technique called **Chained Dead Keys**, mainly to support the dual diacritics of Vietnamese. To use a keyboard like this, you would type each of the accents separately, and then the final data key. Supposing the Q Keyboard did this. Let's take the Vietnamese letter **ộ Ộ with Circumflex and Dot Below**. Our design calls for this to be typed as ***Held Key AA \ K*** • To do the same thing with chained dead keys, you would type the Circumflex dead key as **AA ^** then the Dot Below dead key as **AA ** and finally the **o** letter. Using chained dead keys requires four keys in three separate steps, while Held Keys require three keys in two steps. Thus, chaining takes more time and effort.

Is there any advantage to the chained approach? It ***is*** easier to learn, because the keyboard could be designed to accept the two accents in either order.

But chaining has more drawbacks than advantages. It would always take more keys to type. It's true that the Q Keyboard Held Key method requires a little more effort to **learn**, but all of that effort is "up front". Once you do learn it, it's faster than chaining. While chaining seems more flexible, it's only flexible about dual accents. When you need to place other kinds of characters on the keyboard that don't have dual accents, chaining fails to address this need. In contrast, Held Keys are used for more purposes than just dual accents, such as Cyrillic, math symbols and archaic letters, most of which have no accents at all - much less two of them.

Because chained Dead Keys allow dual accents in either order, that technique would fail in one case. There happens to be a letter **ǖ with Macron and Diaeresis**, and there is another letter **ṻ with Diaeresis and Macron**. Using chaining, it would be a problem to support both of these, since they have the same accents but in reverse order. The Q Keyboard resolves this by making them Held Keys, where you type the key for the lower accent first. Refer to Dual Diacritic Held Key Guide and Pinyin script to see how this is done.

Chained dead keys are a clever and innovative technique, but they are not as good as Held Keys.

How do Held Keys work?

Held Keys are interesting and useful, but they are not "magic" by any means. Let's consider the example above of the **Å** and **Ạ̊** letters. How is it possible for this to work? The answer is relatively straight-forward, but the explanation is a little technical, so unless you are curious you can skip this part.

If you hold the **AA** key and press the **8** key, you activate the "Ring Dead Key introducer". When you do that, the keyboard device driver locates the Dead Key conversion table associated with **8**. That table contains a number of "transformation entries". Each entry contains two values. The first value is the Unicode number of the key you typed, such as the **A** key (**A** = U+0041 and **a** = U+0061). The second value is the Unicode value that your typed key is ***transformed into***.

When a dead key has a ***Held Key*** entry defined for it, the "First" value of that entry is *the value of that key when the **AA** key is held down*. That is, it's the same value as the key when it's being used as a **Live Key** with the **AA** modifier. If you look at the Live Key list, you will see that a live key of **AL A** produces an **ä** with Diaeresis (the entries are **Ä** = U+00C4 and **ä** = U+00E4).

So, the Dead Key table associated with the **8** key has ***two*** entries for the letter **A**. One of those entries is for the ordinary letter **A** when the **AA** modifier is ***not*** being held down, and the other is for the letter **Ä** when **AA** is being held. (As noted, there are actually two sets of these entries, one for upper case and one for lower case.)

You can see this if you type ***AL 8 A*** **A** and observe what appears as you *press and continue to hold* the **AA** key. The first **A** will get converted to **ạ̊** with ring below - **and that concludes the Held Key sequence**. When you type **A** again, it is **no longer** part of a Held Key sequence, but is now a stand-alone Live Key. As a Live Key, **AL A** is the **ä** **with Diaeresis**.

The net result is that **ạ̊ä** will appear.

Issues with Held Keys and N-Key rollover

An important hardware feature on any keyboard is **N-Key Rollover support**, sometimes denoted by the acronym **NKRO**.

NKRO is the ability of the keyboard to allow keys to be typed very quickly, sometimes with one keystroke motion overlapping another. True NKRO allows an essentially arbitrary number of keys to be held down at the same time, and they are "reported back" to the host computer in the order typed. Circuitry in the keyboard keeps this process straight, so that keyboard "jamming", "ghosting" or "dropping" of keys does not occur. When keys are typed so close together that they seem to have been done simultaneously, the circuitry will apply "tie-breaking" logic to force one key to be accepted before the other, to avoid a conflict.

Some manufacturers have devised very robust NKRO circuitry that is virtually impossible to jam or fail. This is often seen on keyboards designed for gaming. These can be relatively expensive compared to non-gaming keyboards.

On less expensive keyboards, the NKRO support may be partial. "Partial" support for NKRO may limit the number of keys held down at a time to three or four. Additionally, the manufacturer may have done an analysis on the likely key combinations expected in normal use. For instance, they may allow 3 keys held down at the same time if those keys are Ctrl, Shift and **X**, but not if those keys are **J**, **K** and **L**. By limiting the allowable combinations to those they think are "reasonable", their keyboard decoding circuitry can be made simpler, and thus less expensive.

<u>How does this issue affect the Q Keyboard?</u>

As noted in the section on <u>Convenience Keys</u>, these are Held Keys intended to make certain letters easier to type. For instance, one of these letters is **Ł** with Dash Stroke. You can type this as a regular Dead Key using the Minus key diacritic and then the **L** key.

As a Convenience Key, you can also type this as ***Shift+AA ; L*** •

A problem could arise because the semicolon key and the **L** key are next to each other. That makes it easy to type these two keys together very quickly - perhaps **too** quickly.

Ordinarily, if you typed **;** and then **L** very quickly afterwards as **plain** characters, the keyboard would have no problem. But, if you are holding down the **AA** key (a repurposed **Alt** key on the software-defined keyboard) while doing this, the keyboard may detect **Shift**+**Alt**+**;** and **Shift**+**Alt**+**L** held down at the same time for a brief moment. When that happens, if the keyboard does not support true NKRO, it could reject this condition as an "undefined keyboard state", or it could malfunction, causing a "ghosting" condition with unpredictable results. That could cause your desired Held Key letter not to appear at all,

or perhaps some "junk" data may be produced instead.

Issues of this sort could happen on any keyboard. You will have to test the keyboard you are using to see if it is affected. This problem may affect wireless keyboards more so than wired keyboards, since the wireless circuitry may impose additional timing constraints as to how fast keys can be successfully typed and transmitted to the host system without failing.

How can this issue be resolved?

Other than buying a more expensive keyboard with better NKRO circuitry that does not exhibit this problem, the easiest way to resolve it is to type more slowly. That is a "low tech" answer to the problem, but is one that should work regardless of the hardware you are using. In the case of Convenience Keys, they still should increase your typing productivity, even if you have to type them a little more slowly.

If this becomes a problem for you, and you are willing to spend the money, some modern gaming keyboards have excellent NKRO logic, and should not fail when used with Held Keys, no matter how fast you type them.

Convenience keys

The Q Keyboard provides a category of keys called **Convenience Keys**. See complete list below.

What are "Convenience Keys"? They are keys with these characteristics:

- They are letters on **Dead Keys** or ***Held Keys*** and can be thought of as a form of "cheating"
- They are redundant, supplementary definitions for letters already present elsewhere
- They exist to make certain letters easier to type

For instance, there is a letter **Ł** with Dash Stroke. If you wanted to type this with a Dead Key, the "official" diacritic for it is the **–** minus key, on the upper right side of the keyboard. There is also a **Convenience Key** definition for this letter. Rather than typing a sequence of **AA – L**, we can type ***AA ; L***. Recall that the ***AA*** notation in ***red italic*** means the sequence is typed as a ***Held Key*** rather than as a **Dead Key**.

> Note that the diacritic key **;** is normally used for **Diaeresis**, not for **Dash Stroke**. That is where the notion of "cheating" comes in.

You may or may not find Convenience Keys to actually be "convenient". The goal behind providing them is to make typing certain kinds of letters a little easier. For instance, some **Sámi** languages use **ǥ Ǥ** with Dash Stroke. Because the **AA –** Dead Key is somewhat far from the **G** key, this is a little hard to type. By adding a Convenience definition on **AA 5 G**, typists needing this letter frequently get an assist. The same is true for **ǵ Ǵ** on **AA 7 G** and the **Caron** letters on **AA 2**.

Over time and with feedback, it is possible that some of these Convenience Keys might updated, augmented or removed, depending on the level of interest and importance in them, and how "convenient" these keys prove to be. Perhaps experience will show that some Convenience Keys are not so important, but others ought to be added where a need for them was not originally foreseen. This is where contributions from users is so important.

If you find Convenience Keys to be helpful, and you can remember they are available, and these are letters you are interested in, they may be of use to you. Otherwise, you can type these letters using the standard key sequences.

Because Convenience Keys are redundant, that makes them 'expendable'. If new requirements arise in the future for additional letters, parts of the keyboard design that were redundant might have to be dispensed with if room were needed to add something new.

Here is the complete list of Convenience Keys. Other definitions that may be on the same

keys have been omitted. See the Dead Key Guide for the complete definition of any key.

The letter **J** on **Dead AU 2 J** is ***defective*** with respect to the Caron accent, since a precomposed letter is available in lower-case, but not in upper-case. As a convenience, an unaccented capital **J** appears below, shown in **yellow on gray background**. If you need this accented, you must add it manually, by typing ***AL]]*** after the letter. You can also use **Live AC J** which is a digraph of **J** and a Caron.

QWERTY Keys		AA Dead Key Symbols				*AA Held Key Symbols*			
LC key	UC key	AL u+	AL sym	AU U+	AU SYM	AL u+	AL sym	AU U+	AU SYM
Dead Key 02 2 @									
g	G	01E7	ǧ	01E6	Ǧ				
h	H	021F	ȟ	021E	Ȟ				
j	J	01F0	ǰ	004A	J				
k	K	01E9	ǩ	01E8	Ǩ				
Dead Key 05 5 %									
g	G	01E5	ꞡ	01E4	Ꞡ				
Dead Key 07 7 &									
g	g	01F5	ǵ	01F4	Ǵ				
Dead Key 1A [{									
w	W	0175	ŵ	0174	Ŵ				
Dead Key 1B] }									
w	W	1E81	ẁ	1E80	Ẁ				
Dead Key 29 ; :									
l	L	026C	ɬ	A7AD	Ɬ	019A	ƚ	023D	Ł
Dead Key 38 . >									
u	U	1EE5	ụ	1EE4	Ụ				
j	J	0237	ȷ	0248	Ɉ				
k	K	1E33	ḳ	1E32	Ḳ				

v	V	1E7F	ẏ	1E7E	Ẏ				

Combining diacritics

This section describes the Q Keyboard **Combining Diacritics** facility. A very extensive repertoire of combining symbols is available for you to add accents to base letters. That makes it possible to represent letters from lesser-used languages when not all of them have precomposed characters defined in the Unicode standard.

Combining diacritics are often used by linguists and scholars to discuss very technical details about languages with other language experts. Few of these symbols are seen in everyday use. It is not possible to support every single one, but nearly all of these combining accents are at your disposal.

Unicode currently defines some 337 combining symbols, of which 151 are include in the Q Keyboard.

All combining Cyrillic letters and most combining Latin letters have been omitted, both because they are rarely used and because they are poorly represented in fonts. In addition, some combining modifiers are very unusual, like a "combining infinity" and those known as "combining diacritic marks for symbols".

The remaining supported symbols are the ones you will most likely need. They include combining versions of every Dead Key accent type, as well as the vast majority of symbols present in modern languages that require extra accent types, and those commonly used by linguists.

Diacritic or Diacritical?

According to Wikipedia, "**Diacritic** is primarily an adjective, though sometimes used as a noun, whereas **diacritical** is only ever an adjective. Some diacritical marks, such as the acute and grave, are often called accents." So, we can correctly say, "diacritical marks" or "diacritical marks", or just diacritics, but not "diacritical" or "diacriticals" **alone** to mean the mark itself.

The word "accent" is sometimes treated as a shorthand for "Grave Accent" or "Acute Accent", but is often used in a more general sense to mean any mark added to a base letter, such as Diaeresis, Tilde or Macron.

Introduction to combining diacritics

A **combining diacritic** is a special character, entered with a key sequence similar to a Dead Key or Held Key.

As the name implies, these characters "combine" with the character that precedes them, by overlaying one graphic image on top of another. The procedure is that you first type a base letter, then type the desired combining symbol afterwards.

The operating system implements a combining symbol by overlaying the graphic shape of the accent onto the previously-typed letter, while not advancing the cursor position. It often must calculate exactly **where** to place this symbol, carefully taking the size, shape and other attributes of the prior character into account. These calculations rely upon extra, auxiliary data embedded in the font definition file, which contains sizing, positioning and formatting attributes.

Properly performing those steps makes the combined graphic more attractive and easier to read. When a font behaves in this way, it is a sign of a high-quality, well-designed font. You will find that some fonts - but not all - are designed this well.

Adding a diacritic to a base letter is often called "composing" a letter. You would compose a letter when you need an accented letter that doesn't exist as a single, precomposed Unicode character value.

This overlaying process is enabled by the way fonts are designed, and how well Unicode-compliant software implements this usage. Some of that software is part of the Windows graphics and font-rendering subsystems, and some is dependent on how well an application like a word processor is designed.

The font you select must be carefully crafted to operate correctly when using combining symbols, and not all fonts do this properly. Do not simply **assume** that it will work. Some well-known fonts can reveal significant errors when used with combining symbols. You must test your documents with the desired fonts to make sure you get the results you want. For instance, Times New Roman works for many of its letters, while Courier New is all but unusable for combining accents. In contrast, the font Gentium Plus from SIL was evidently designed from the ground up to accommodate combining accents, and it often (but not always) performs very well with that feature. This matter is discussed in detail under Font issues.

> If you happen to experiment with this feature, you may notice that combining accents often work well when you combine them with letters that already had precomposed forms. For instance, most fonts that have **ö** with Diaeresis as a precomposed letter will work properly when you start with a plain **o** and then manually add the Diaeresis afterwards, even if they don't work right with some unusual letter like **Q**. This may be because the font designer had to go through the effort of configuring accents for the

letter **ö** but didn't extend that effort to other letters that don't normally take them.

In some cases, it is possible to add multiple combining diacritics to a single letter. How well this does or does not work is, again, dependent on the quality of the font in use and on where the combining symbols are located. For instance, you may be able to add one symbol above and one below a letter, but not be able to add two symbols above.

As noted in the preface for Dot Above Key 38, you may be able to "pile" two Dot-Above marks on top of each other to simulate a "Colon Above", a combining symbol that doesn't ordinarily exist but is sometimes used by linguists.

You may find that a number of symbols will not work properly at all. For instance, if you attempt to add a combining Diaeresis symbol to the digit 8 it probably won't work, because the font designer did not expect or plan for such nonstandard usage. As a result, the various font attributes in the font that are needed to enable this are missing from a symbol like the digit 8, and so it won't work.

That is unfortunate. There are, in fact, some Latin-based languages that actually use digits as letters, or have done so in the past. (For example, certain indigenous languages have used the digit **7** as a glottal stop symbol when a real glottal symbol **ʔ** was unavailable. Others have used the digit **3** as a "reversed Open E" or similar symbol.) So, the concept of adding accents to digits is not as "crazy" as it might first sound. In testing this idea with the Calibri font, attempting to add a Diaeresis to the digit **8** causes the Diaeresis to simply disappear. Using Gentium Plus (a font that often works well with combining accents), it gets added correctly.

Why doesn't every symbol in every font consistently contain the glyph attributes needed to apply any accent to any symbol? Mainly because much of font creation must be manually hand-crafted, requiring a developer to spend hundreds or thousands of hours working with a font-design program. Like everything else, time is money, and font designers don't want to spend the time adding font attributes to symbols they think people will rarely if ever put accents on. Couldn't the process be automated somehow? Yes, in theory; but in practice font design is a visual art. You could write a program to determine where an accent should go, but the human eye is a much better judge of what looks good than any program would ever be. Automated methods are a possible 'brute force' approach to solve this problem, but attractive fonts really need the human touch to be done properly.

The affect of font design on combining diacritics

The appearance of combining diacritics is sometimes affected by the font definition, in ways you cannot change. For instance, N with Cedilla is rendered in most fonts as if it were N with Comma Below, because Latvian speakers prefer it that way. So, the **precomposed** N with Cedilla looks like Comma Below. If you try to deliberately add a combining Cedilla to a **plain** letter N, most fonts will force it to be rendered as Comma

Below and will refuse to display a Cedilla; there is nothing you can do about that. However, since there are no languages that use or expect N with Cedilla to have a Cedilla like the ç Ç in French, this restriction should not pose an inconvenience.

The Q Keyboard makes it easy to add combining diacritics

Let's say you want to type a **q̀** with a grave accent. There is no such letter defined in Unicode, but suppose you wanted one anyway. Now, the Dead Key introducer for grave-accented letters like **à** is **AA**+*grave*.

> Remember we are referring to the **` ~ accent/tilde** key, not the **' "** key with the apostrophe and quotation mark on it. That key is for *Acute* accents, not Grave accents.

If you try to to type **AA**+*grave* and then the **Q** key, you will get **àq** as Dead Key Junk characters. So, an attempt to make a **q̀** with a grave accent "the easy way" doesn't work.

To get the desired accented letter, type the plain letter **q** first. Then, holding the **AA** modifier key, type the grave-accent key **twice**. That produces the grave-accent modifier symbol (in this case, U+0300), which your word processor or other application will overlay on top of the preceding **q** to give you the **q̀** letter you needed.

Note that the key sequence to type many combining diacritic symbols is similar to what you would use when typing a ***Held Key***, since you must hold **AA** until you have typed the grave-accent key **twice**. See the section on Held Keys for more information.

On Key **0** (zero) you will find Combining Small Letters as **Held Keys**. These symbols are used by linguists, and occasionally in some scripts. For instance, you can put a small letter **E** on letter **O** as Ȏ using the sequence **o** ***AU 0 E*** • The readability of these combining letters varies considerably, based on the font used. In testing, the DejaVu Sans and Roman Cyrillic Std fonts worked well for this purpose.

The double-width combining symbols are somewhat unusual, since they straddle two character positions.

Example: Put **U+0360 Combining Double Tilde** over the letters **a** and **e**. This symbol is on ***Held AU 1 1***.

- Type first letter **a**
- Hold **AA**+**Shift** and type **1** twice
- Type second letter **e** which will also go under the double Tilde; you now have **a͠e**

Example: Put **U+035C Combining Double Breve Below** under the letters **a** and **e**. This symbol is on **Dead AU 0 0**.

- Type first letter **a**
- Hold **AA**+**Shift** and type **0** once
- Release AA+Shift and type **0** a second time
- Type second letter **e** which will also go under the double Tilde; you now have **a͡e**

> There are similar double-width combining symbols at **U+FE20** to **U+FE23**, which resemble an inverted Breve and a Tilde. These were not included because they are present in few fonts, and testing revealed that even when present, they are often implemented incorrectly by font vendo The symbols shown below on ***Held AU 1 1*** and ***Held AU 9 9*** usually work well, so it should not cause an inconvenience to omit the ones at U+FE20 to U+FE23.

Note: To create a dotted-circle character ◌ for illustrating a combining symbol, type ***AL 0 0***. This documentation generally uses a lower-case **o**, rather than a dotted circle, to illustrate accents.

If you wish to use a particular symbol, be sure to test your font to confirm availability.

Note that **U+1DD8 Combining Latin Small Letter Insular D** is present in few fonts, but is defined here for sake of completeness.

U+0341 Combining Acute Tone Mark on the **'** key may be difficult to distinguish from **U+0301 Combining Acute Accent**, depending on the font used.

The Unicode standard defines several "combining Latin letters", known as the "Combining Diacritical Marks Supplement", in the range **U+1DC0** to **U+1DC0**. These are not supported in the Q Keyboard because these supplemental combining symbols are present in very few fonts.

The symbols **U+20D2 Combining Long Vertical Line Overlay** and **U+20E6 Combining Double Vertical Stroke Overlay** do not render well in most fonts. The current state of support for these symbols in many fonts is poor. Unless you are using one of the few fonts where they are both present and properly defined, you will generally not be able to use them.

On Key 0A **(0)** you will find **Combining Small Letters** as ***Held Keys***. These symbols are used by linguists, and occasionally in some scripts. For instance, you can put a small letter **e** on letter **O** as **o̊** using **o** ***AU 0 E***. The readability of these combining letters varies considerably, based on the font type and font size used. In testing, the fonts Calibri, DejaVu Sans and Roman Cyrillic Std worked successfully.

Avoiding combining-diacritic mistakes

It is important to avoid typing mistakes with Dead Keys and combining diacritics. You must type most diacritic keys (like the grave accent key) **twice** when you want to get a combining diacritic symbol.

> Some supplemental diacritics are typed differently, but have similar issues. For more information, refer to Combining Diacritics Dead Key List and Combining Diacritics Complete List.

What happens if you keep holding a diacritic key ***too long***?

Because of the keyboard's standard **autorepeat feature**, you could end up with **multiple combining symbols "piled on top of each other"**. It's possible that you may see some but not all of them. When too many accents are added to a letter, the operating system will visually 'truncate' the excess ones if there is no more room left to display them, but it still records the fact that you asked for them to be added. It is a strange result, and is certainly not what you wanted.

> It is possible to defeat this problem by disabling your keyboard's autorepeat feature. Because autorepeat is handy and useful to have, disabling it is a drastic step that most people would find unacceptable. Note that while slowing down the keyboard speed is relatively easy using the Windows Control Panel, completely disabling autorepeat in Windows may be a bit tricky, and is dependent on the version of Windows you are using. There are forums you can find on the Internet that explain how this can be done.
>
> You could also get extraneous combining symbols if you typed a diacritic key so hard that it "bounced" and inadvertently typed the key two or more times. The likelihood of this happening depends on the relative quality of your keyboard, and how "heavy-handed" you are when you type.

To undo such mistakes, simply Backspace over the combining symbols. If you have accidentally added a large number of combining symbols "piled on top of each other", you might not immediately see the cursor move left as you continue to press Backspace, but internally, your word processor will be deleting them. Once the last one is gone, you will be left with your unmodified, plain letter. At that point, you can add the combining symbol correctly, continue typing, or take other corrective action as needed.

You must be mindful of this issue because, if you were just trying to type an ordinary Dead Key (one where you did ***not*** want to include a combining symbol) and you happened to hold the diacritic key too long, the autorepeat feature will cause one or more of these combining symbols to be created anyway, ***even if that was not what you had intended***.

The main thing to remember is that when typing a Dead Key diacritic, ***don't hold it too long***. Just type it and release it quickly, to avoid problems like this.

If you are one of those "heavy-handed" typists, try to make a conscious effort to 'lighten up' and not type so hard. Typing consists mostly of habits, and sometimes you have to change those habits. You can also try to obtain a keyboard that has a lighter touch that requires less effort to press keys. That might not only help prevent key bouncing problems, but will be better for your hands and lessen the likelihood of suffering from stress-related hand and wrist problems.

Changing keyboard settings to avoid combining diacritic issues

If this occurs frequently, increasing the keyboard **repeat delay** will probably resolve this issue. That is the keyboard timing factor which determines how long the keyboard **waits** until it first starts its autorepeat function. If you make this delay longer, it will give you more time to release the diacritic key before it is (incorrectly) interpreted as a request to create a duplicated combining symbol. This can be adjusted in the Keyboard option of the Windows Control Panel. Changing the delay factor will not affect how you might manually repeat a key to add a combining accent.

You can also try slowing down the keyboard **repeat rate**, without completely disabling autorepeat. Most users should find that increasing the repeat **delay** is enough to correct the problem, without changing the repeat **rate**.

Combining diacritics dead key list

The following is a list of the combining diacritics associated with each **Dead Key**.
To see **every** combining diacritic, refer to the comprehensive lists by Description and by Unicode value.

Primary combining symbols are typed in the same manner as ***Held Keys.*** Hold **AA** and type the indicated dead key **twice**.

Secondary combining symbols are typed in the same manner as **Dead Key**. First, hold **AA** and type the indicated dead key once. Then, release AA and type the dead key a second time.

Primary literal symbols are typed much like other international keyboards. Hold **AA**, type the indicated dead key, then type the Spacebar. You can release the **AA** modifier whenever it's convenient, either before or after you press Spacebar.

Secondary literal symbols use a keying technique unique to the Q Keyboard. First, hold **AA** and type the indicated dead key once. Then, release all keys, hold **BB** and type the dead key a second time. This technique is called an **AL/BL** key sequence, and is discussed further in Understanding modifier key notation.

The key sequences that normally would have been used for Literal symbols on **AA X space** will produce Non-Breaking Space instead. **AA M space** will produce Narrow Non-Breaking Space. Key W has no literals or combining modifiers.

When a combining symbol has no corresponding **literal** symbol, it is shown below as an empty entry in the table. If you try to type an undefined literal, you will get some junk characters, which will usually be a Representative Letter.

Some opposing dead key Combining and Literal symbols are "paired"

When an accent type has both an "above" and a "below" form, and the given key is not being used for other purposes, some of the keys are "paired. For instance, the main roles of Key 6 and Key [1A are for CIrcumflex and Circumflex Below, respectively. However, the Primary Combining and Literal symbols for Key 1A are the Secondary symbols for Key 6, and vice versa. That is, ***Held AL 6 6*** has a combining Circumflex, while **Dead AL 6 6** has a combining Circumflex Below. The opposite is true on the **[** key.

Why was this done? Mainly as a convenience, so if your hands happened to be positioned at one of the "other" keys, and it had an accent you were interested in, you could take advantage of it. Using "paired" accents in this way will take some practice to remember and get used to. If this is a feature that is not important to you, you can use most keys in their "primary" role.

Held AL Dead AL	Rep. Letter	Combining Diacritics		Description of Primary Diacritic Symbol	Primary Literals	
		U+	Sym		U+	Sym
AL ` `	00E0 à 00C0 À	0300	◌̀	Grave Above	02CB	ˋ
AL 1 1	00E3 ã 00C3 Ã	0303	◌̃	Tilde Above	02DC	˜
AL 2 2	1E1B ẽ 1E1A Ẽ	0330	◌̰	Tilde Below	02F7	˰
AL 3 3	0201 ȁ 0200 Ȁ	030B	◌̋	Double Acute	02F6	˶
AL 4 4	03B4 δ 0394 Δ	0344	◌̈́	Greek Dialytika Tonos	0385	΄
AL 5 5	0105 ą 0104 Ą	0328	◌̨	Ogonek Below	02DB	˛
AL 6 6	00E2 â 00C2 Â	0302	◌̂	Circumflex Above	02C6	ˆ
AL 7 7	1EA3 ả 1EA2 Ả	0309	◌̉	Hook Above	02C0	ˀ
AL 8 8	00E5 å 00C5 Å	030A	◌̊	Ring Above	02DA	˚
		0351	◌̑	Left Half Ring Above Comb. Type *AL 8 9* as a *held key*		
		0357	◌̒	Right Half Ring Above Comb. Type *AL 8 0* as a *held key*		
				Left Half Ring Above Literal Type AL 8 [as a dead key	02BF	ʿ
				Right Half Ring Above Literal Type AL 8] as a dead key	02BE	ʾ
				Left Half Ring Below Literal Type *AL 8 [* as a *held key*	02D3	˓
				Right Half Ring Below Literal Type *AL 8]* as a *held key*	02D2	˒
AL 9 9	0203 ȃ 0202 Ȃ	0311	◌̑	Inverted Breve Above	1D54	ᵔ
AL 0 0	0115 ĕ 0114 Ĕ	0306	◌̆	Breve Above	02D8	˘
AL - -	0111 đ 0110 Đ	0305	◌̄	Overline	00AD	-

AL = =	1E21 ḡ 1E20 Ḡ	0304	ō	Macron Above	00AF	¯
AL W W	0448 ш 0428 Ш			Cyrillic		
AL [[	1E19 ḙ 1E18 Ḙ	032D	ọ̭	Circumflex Below	A788	ˆ
AL]]	01CE ǎ 01CD Ǎ	030C	ǒ	Caron Above	02C7	ˇ
*AL \ *	1EA1 ạ 1EA0 Ạ	0323	ọ	Dot Below		
AL ; ;	1E8D ẍ 1E8C Ẍ	0308	ö	Diaeresis Above	00A8	¨
AL ' '	00E1 á 00C1 Á	0301	ó	Acute Above	00B4	´
AL X X	0253 ɓ 0181 Ɓ			Extra letters	00A0	NBSP
AL M M	026F ɯ 019C Ɯ			Miscellaneous letters	202F	NNBSP
		033F	o̿	Type *AL m* – as a *held key*		
				Type AL m – as a dead key	02ED	˭
		0333	o̳	Type *AL m =* as a *held key*		
				Type AL m = as a dead key	2017	‗
AL , ,	00E7 ç 00C7 Ç	0327	ọ̧	Cedilla Below	00B8	¸
AL . .	0227 ȧ 0226 Ȧ	0307	ȯ	Dot Above	02D9	˙
AL / /	2C65 ⱥ 023A Ⱥ	0338	ø	Slash Stroke Long Solidus Overlay	2215	∕
Key	Rep. Letter	Combining Diacritics		Description of AL/BL Secondary Diacritic Symbol	Secondary Literals	
		U+	Symbol		U+	Symbol
AL ` `	00E0 à 00C0 À	0316	ọ̖	Grave Below	02CE	ˎ
AL 1 1	00E3 ã 00C3 Ã	0330	ọ̰	Tilde Below	02F7	˷
AL 2 2	1E1B ḛ 1E1A Ḛ	0334	ọ̴	Middle Tilde	02DC	˜

AL 3 3	0201 ȁ 0200 Ȁ	030F	̏	Double Grave	02F5	˵
AL 4 4	03B4 δ 0394 Δ					
AL 5 5	0105 ą 0104 Ą	1DCE	̨	Ogonek Above		
AL 6 6	00E2 â 00C2 Â	032D	̭	Circumflex Below	A788	ˆ
AL 7 7	1EA3 ả 1EA2 Ả			---		
AL 8 8	00E5 å 00C5 Å	0325	̥	Ring Below	02F3	˳
		031C	̜	Left Half Ring Below Comb. Type *AU 8 9* as a *held key*		
		0339	̹	Right Half Ring Below Comb. Type *AU 8 0* as a *held key*		
AL 9 9	0203 ȃ 0202 Ȃ	032F	̯	Inverted Breve Below		
AL 0 0	0115 ĕ 0114 Ĕ	032E	̮	Breve Below	1D55	˘
AL - -	0111 đ 0110 Đ	0332	̲	Line Below		
AL = =	1E21 ḡ 1E20 Ḡ	0331	̱	Macron Below	02CD	ˍ
AL W W	0448 ш 0428 Ш			Cyrillic		
AL [[	1E19 ḙ 1E18 Ḙ	0302	̂	Circumflex	02C6	ˆ
AL]]	01CE ǎ 01CD Ǎ	032C	̬	Caron Below	02EC	ˬ
AL \ \	1EA1 ạ 1EA0 Ạ	20E5	⃥	Reverse Solidus Overlay		
AL ; ;	1E8D ẍ 1E8C Ẍ	0324	̤	Diaeresis Below	2025	‥
AL ' '	00E1 á 00C1 Á	0317	̗	Acute Below	02CF	ˏ
AL X X	0253 ɓ 0181 Ɓ			Extra letters		

AL M M	026F ɯ 019C ƜI			Miscellaneous letters		
		0347	ͅ	Type *AU m =* as a *held key*		
AL , ,	00E7 ç 00C7 Ç	0326	̦	Comma Below		
AL . .	0227 ȧ 0226 Ȧ	0323	̣	Dot Below		
AL / /	2C65 ⱥ 023A Ⱥ	0327	̧	Slash Stroke Short Solidus Overlay		

Combining diacritics by Description

Combining Diacritics in order by Description

U+	Sym	Keys	Description
0301	́	*Held AL ' '*	Combining Acute Accent
0317	̗	Dead AL ' '	Combining Acute Accent Below
0341	̕	Dead AL ' :	Combining Acute Tone Mark
1DC9	᷉	*Held AL ' `*	Combining Acute-Grave-Acute
1DC7	᷇	*Held AL / -*	Combining Acute-Macron
20F0	⃰	Dead AL 6 8	Combining Asterisk Above
0359	͙	*Held AL 6 8*	Combining Asterisk Below
0306	̆	*Held AL 0 0*	Combining Breve
032E	̮	Dead AL 0 0	Combining Breve Below
1DCB	᷋	Dead AL 0 =	Combining Breve-Macron
0346	̦	Dead AL [ ]	Combining Bridge Above
032A	̪	Dead AL [\	Combining Bridge Below
0310	̐	*Held AL . 0*	Combining Candrabindu
030C	̌	*Held AL]]*	Combining Caron
032C	̬	Dead AL]]	Combining Caron Below
0327	̧	*Held AL , ,*	Combining Cedilla
0302	̂	*Held AL 6 6*	Combining Circumflex Accent
0302	̂	Dead AL [[	Combining Circumflex Accent
032D	̭	Dead AL 6 6	Combining Circumflex Accent Below
032D	̭	*Held AL [[*	Combining Circumflex Accent Below
0313	̓	*Held AL , 9*	Combining Comma Above
0315	̕	*Held AL , 7*	Combining Comma Above Right
0326	̦	Dead AL , ,	Combining Comma Below
0485	҅	*Held AL W `*	Combining Cyrillic Dasia Pneumata
0484	҄	*Held AL W :*	Combining Cyrillic Palatalization
0487	҇	*Held AL W 9*	Combining Cyrillic Pokrytie

0486	҃	*Held AL W '*	Combining Cyrillic Psili Pneumata
0483	҃	*Held AL W -*	Combining Cyrillic Titlo
0308	̈	*Held AL : :*	Combining Diaeresis
0324	̤	Dead AL : :	Combining Diaeresis Below
0307	̇	*Held AL . .*	Combining Dot Above
0358	̙	*Held AU . /*	Combining Dot Above Right
0323	̣	*Held AL \ *	Combining Dot Below
0323	̣	Dead AL . .	Combining Dot Below
030B	̋	*Held AL 3 3*	Combining Double Acute Accent
035D	͝	*Held AU 0 0*	Combining Double Breve
035C	͜	Dead AU 0 0	Combining Double Breve Below
1DCD	᷍	*Held AU 6 6*	Combining Double Circumflex Above
030F	̏	Dead AL 3 3	Combining Double Grave Accent
0361	͡	*Held AU 9 9*	Combining Double Inverted Breve
0333	̳	*Held AL M =*	Combining Double Low Line
035E	͞	*Held AL = 9*	Combining Double Macron
035F	͟	*Held AL = 0*	Combining Double Macron Below
033F	̿	*Held AL M -*	Combining Double Overline
0360	̠	*Held AU 1 1*	Combining Double Tilde
030E	̎	Dead AL = '	Combining Double Vertical Line Above
0348	̪	*Held AL = '*	Combining Double Vertical Line Below
20E6	⃦	*Held AU \ *	Combining Double Vertical Stroke Overlay
031E	̞	*Held AL 0 [*	Combining Down Tack Below
0347	̧	*Held AU M =*	Combining Equals Sign Below
0352	̒	*Held AL . 9*	Combining Fermata
20DC	⃜	*Held AL : 4*	Combining Four Dots Above
034F	*n/a*	*Held AL / C*	Combining Grapheme Joiner
0300	̀	*Held AL ` `*	Combining Grave Accent
0316	̖	Dead AL ` `	Combining Grave Accent Below
0340	̀	Dead AL ` :	Combining Grave Tone Mark

1DC8	◌᷉	*Held AL ` '*	Combining Grave-Acute-Grave
1DC5	◌᷅	*Held AL \ -*	Combining Grave-Macron
0344	◌̈́	*Held AL 4 4*	Combining Greek Dialytika Tonos
0342	◌͂	*Held AL 2 `*	Combining Greek Perispomeni
0309	◌̉	*Held AL 7 7*	Combining Hook Above
031B	◌̛	*Held AL , M*	Combining Horn
0311	◌̑	*Held AL 9 9*	Combining Inverted Breve
032F	◌̯	Dead AL 9 9	Combining Inverted Breve Below
033A	◌̺	Dead AL] \	Combining Inverted Bridge Below
032B	◌̪	*Held AL 9 0*	Combining Inverted Double Arch Below
0363	◌ᵃ	*Held AU 0 A*	Combining Latin Small Letter A
0368	◌ᶜ	*Held AU 0 C*	Combining Latin Small Letter C
0369	◌ᵈ	*Held AU 0 D*	Combining Latin Small Letter D
0364	◌ᵉ	*Held AU 0 E*	Combining Latin Small Letter E
036A	◌ʰ	*Held AU 0 H*	Combining Latin Small Letter H
0365	◌ⁱ	*Held AU 0 I*	Combining Latin Small Letter I
1DD8	◌ᵭ	*Held AU 8 D*	Combining Latin Small Letter Insular D
036B	◌ᵐ	*Held AU 0 M*	Combining Latin Small Letter M
0366	◌ᵒ	*Held AU 0 O*	Combining Latin Small Letter O
036C	◌ʳ	*Held AU 0 R*	Combining Latin Small Letter R
1DCA	◌ᵣ	*Held AL ` R*	Combining Latin Small Letter R Below
036D	◌ᵗ	*Held AU 0 T*	Combining Latin Small Letter T
0367	◌ᵘ	*Held AU 0 U*	Combining Latin Small Letter U
036E	◌ᵛ	*Held AU 0 V*	Combining Latin Small Letter V
036F	◌ˣ	*Held AU 0 X*	Combining Latin Small Letter X
031A	◌̚	Dead AL 6 -	Combining Left Angle Above
0349	◌̩	*Held AL 6 -*	Combining Left Angle Below
20D6	◌⃖	*Held AL 8 ,*	Combining Left Arrow Above
1DFE	◌᷾	Dead AL : ,	Combining Left Arrowhead Above
0354	◌ᷣ	*Held AL : ,*	Combining Left Arrowhead Below

0351	◌	*Held AL 8 9*	Combining Left Half Ring Above
031C	◌	*Held AU 8 9*	Combining Left Half Ring Below
20D0	◌	Dead AL 8 ,	Combining Left Harpoon Above
20E1	◌	*Held AL 8 /*	Combining Left Right Arrow Above
0318	◌	Dead AL 0]	Combining Left Tack Below
0338	◌	*Held AL / /*	Combining Long Solidus Overlay
0336	◌	*Held AL = -*	Combining Long Stroke Overlay
20D2	◌	Dead AU \ \	Combining Long Vertical Line Overlay
0332	◌	Dead AL - -	Combining Low Line
0304	◌	*Held AL = =*	Combining Macron
0331	◌	Dead AL = =	Combining Macron Below
1DC4	◌	*Held AL - /*	Combining Macron-Acute
1DCC	◌	Dead AL = 0	Combining Macron-Breve
1DC6	◌	*Held AL - *	Combining Macron-Grave
0320	◌	*Held AL 8 -*	Combining Minus Sign Below
0328	◌	*Held AL 5 5*	Combining Ogonek
1DCE	◌	Dead AL 5 5	Combining Ogonek Above
0305	◌	*Held AL - -*	Combining Overline
0321	◌	*Held AL , J*	Combining Palatalized Hook Below
031F	◌	*Held AL 8 =*	Combining Plus Sign Below
0322	◌	*Held AL , L*	Combining Retroflex Hook Below
20E5	◌	Dead AL \ \	Combining Reverse Solidus Overlay
0314	o	*Held AL , 8*	Combining Reversed Comma Above
20D7	◌	*Held AL 8 .*	Combining Right Arrow Above
0350	◌	Dead AL : .	Combining Right Arrowhead Above
0355	◌	*Held AL : .*	Combining Right Arrowhead Below
0357	◌	*Held AL 8 0*	Combining Right Half Ring Above
0339	◌	*Held AU 8 0*	Combining Right Half Ring Below
20D1	◌	Dead AL 8 .	Combining Right Harpoon Above
0319	◌	Dead AL 0 [	Combining Right Tack Below

030A	◌̊	*Held AL 8 8*	Combining Ring Above
0325	◌̥	Dead AL 8 8	Combining Ring Below
033C	◌̼	*Held AL 0 9*	Combining Seagull Below
0337	◌̸	Dead AL / /	Combining Short Solidus Overlay
0335	◌̶	Dead AL = -	Combining Short Stroke Overlay
033B	◌̺	*Held AL 8 7*	Combining Square Below
20DB	◌⃛	*Held AL : 3*	Combining Three Dots Above
0303	◌̃	*Held AL 1 1*	Combining Tilde
0330	◌̰	Dead AL 1 1	Combining Tilde Below
0330	◌̰	*Held AL 2 2*	Combining Tilde Below
0334	◌̴	Dead AL 2 2	Combining Tilde Overlay
0312	o̓	*Held AL , 6*	Combining Turned Comma Above
031D	◌̝	*Held AL 0]*	Combining Up Tack Below
034E	◌̟	Dead AL 8 /	Combining Upwards Arrow Below
030D	◌̍	Dead AL - '	Combining Vertical Line Above
0329	◌̩	*Held AL - '*	Combining Vertical Line Below
033E	◌̾	*Held AL 2 1*	Combining Vertical Tilde
20E9	◌⃩	*Held AL [ ]*	Combining Wide Bridge Above
033D	◌̽	Dead AL / X	Combining X Above
0353	◌̓	Dead AL \ X	Combining X Below
035B	◌͛	Dead AL / Z	Combining Zigzag Above

Combining diacritics by Unicode

Combining Diacritics in order by Unicode value

U+	Sym	Keys	Description
0300	ò	*Held AL ` `*	Combining Grave Accent
0301	ó	*Held AL ' '*	Combining Acute Accent
0302	ô	*Held AL 6 6*	Combining Circumflex Accent
0302	ô	Dead AL [[	Combining Circumflex Accent
0303	õ	*Held AL 1 1*	Combining Tilde
0304	ō	*Held AL = =*	Combining Macron
0305	o̅	*Held AL - -*	Combining Overline
0306	ŏ	*Held AL 0 0*	Combining Breve
0307	ȯ	*Held AL . .*	Combining Dot Above
0308	ö	*Held AL : :*	Combining Diaeresis
0309	ỏ	*Held AL 7 7*	Combining Hook Above
030A	o̊	*Held AL 8 8*	Combining Ring Above
030B	ő	*Held AL 3 3*	Combining Double Acute Accent
030C	ǒ	*Held AL]]*	Combining Caron
030D	o̍	Dead AL - '	Combining Vertical Line Above
030E	o̎	Dead AL = '	Combining Double Vertical Line Above
030F	ȍ	Dead AL 3 3	Combining Double Grave Accent
0310	o̐	*Held AL . 0*	Combining Candrabindu
0311	ȏ	*Held AL 9 9*	Combining Inverted Breve
0312	o̒	*Held AL , 6*	Combining Turned Comma Above
0313	o̓	*Held AL , 9*	Combining Comma Above
0314	o̔	*Held AL , 8*	Combining Reversed Comma Above
0315	o̕	*Held AL , 7*	Combining Comma Above Right
0316	o̖	Dead AL ` `	Combining Grave Accent Below
0317	o̗	Dead AL ' '	Combining Acute Accent Below
0318	o̘	Dead AL 0]	Combining Left Tack Below
0319	o̙	Dead AL 0 [	Combining Right Tack Below

031A	o⌐	Dead AL 6 -	Combining Left Angle Above
031B	o'	*Held AL , M*	Combining Horn
031C	o̪	*Held AU 8 9*	Combining Left Half Ring Below
031D	o̯	*Held AL 0]*	Combining Up Tack Below
031E	o̮	*Held AL 0 [*	Combining Down Tack Below
031F	o̟	*Held AL 8 =*	Combining Plus Sign Below
0320	o̠	*Held AL 8 -*	Combining Minus Sign Below
0321	oʲ	*Held AL , J*	Combining Palatalized Hook Below
0322	oˡ	*Held AL , L*	Combining Retroflex Hook Below
0323	ọ	*Held AL \ *	Combining Dot Below
0323	ọ	Dead AL . .	Combining Dot Below
0324	ọ̤	Dead AL : :	Combining Diaeresis Below
0325	ọ̥	Dead AL 8 8	Combining Ring Below
0326	o,	Dead AL , ,	Combining Comma Below
0327	o̧	*Held AL , ,*	Combining Cedilla
0328	ǫ	*Held AL 5 5*	Combining Ogonek
0329	o̩	*Held AL - '*	Combining Vertical Line Below
032A	o̪	Dead AL [\	Combining Bridge Below
032B	o̫	*Held AL 9 0*	Combining Inverted Double Arch Below
032C	o̬	Dead AL]]	Combining Caron Below
032D	o̭	Dead AL 6 6	Combining Circumflex Accent Below
032D	o̭	*Held AL [[*	Combining Circumflex Accent Below
032E	o̮	Dead AL 0 0	Combining Breve Below
032F	o̯	Dead AL 9 9	Combining Inverted Breve Below
0330	o̰	Dead AL 1 1	Combining Tilde Below
0330	o̰	*Held AL 2 2*	Combining Tilde Below
0331	o̱	Dead AL = =	Combining Macron Below
0332	o̲	Dead AL - -	Combining Low Line
0333	o̳	*Held AL M =*	Combining Double Low Line
0334	o͓	Dead AL 2 2	Combining Tilde Overlay

0335	⃦	Dead AL = -	Combining Short Stroke Overlay
0336	⃧	*Held AL = -*	Combining Long Stroke Overlay
0337	⃨	Dead AL / /	Combining Short Solidus Overlay
0338	⃩	*Held AL / /*	Combining Long Solidus Overlay
0339	⃪	*Held AU 8 0*	Combining Right Half Ring Below
033A	⃫	Dead AL] \	Combining Inverted Bridge Below
033B	⃬	*Held AL 8 7*	Combining Square Below
033C	⃭	*Held AL 0 9*	Combining Seagull Below
033D	⃮	Dead AL / X	Combining X Above
033E	⃯	*Held AL 2 1*	Combining Vertical Tilde
033F	⃰	*Held AL M -*	Combining Double Overline
0340	̀	Dead AL ` :	Combining Grave Tone Mark
0341	́	Dead AL ' :	Combining Acute Tone Mark
0342	͂	*Held AL 2 `*	Combining Greek Perispomeni
0344	̈́	*Held AL 4 4*	Combining Greek Dialytika Tonos
0346	̆	Dead AL [ ]	Combining Bridge Above
0347	⃱	*Held AU M =*	Combining Equals Sign Below
0348	⃲	*Held AL = '*	Combining Double Vertical Line Below
0349	⃳	*Held AL 6 -*	Combining Left Angle Below
034E	⃔	Dead AL 8 /	Combining Upwards Arrow Below
034F	*n/a*	*Held AL / C*	Combining Grapheme Joiner
0350	̐	Dead AL : .	Combining Right Arrowhead Above
0351	̑	*Held AL 8 9*	Combining Left Half Ring Above
0352	̒	*Held AL . 9*	Combining Fermata
0353	⃕	Dead AL \ X	Combining X Below
0354	⃖	*Held AL : ,*	Combining Left Arrowhead Below
0355	⃗	*Held AL : .*	Combining Right Arrowhead Below
0357	̓	*Held AL 8 0*	Combining Right Half Ring Above
0358	̇	*Held AU . /*	Combining Dot Above Right
0359	⃘	*Held AL 6 8*	Combining Asterisk Below

035B	͛o	Dead AL / Z	Combining Zigzag Above
035C	o͝	Dead AU 0 0	Combining Double Breve Below
035D	o͡	*Held AU 0 0*	Combining Double Breve
035E	o͞	*Held AL = 9*	Combining Double Macron
035F	o͟	*Held AL = 0*	Combining Double Macron Below
0360	o͠	*Held AU 1 1*	Combining Double Tilde
0361	o͡	*Held AU 9 9*	Combining Double Inverted Breve
0363	aͣo	*Held AU 0 A*	Combining Latin Small Letter A
0364	eͤo	*Held AU 0 E*	Combining Latin Small Letter E
0365	iͥo	*Held AU 0 I*	Combining Latin Small Letter I
0366	oͦo	*Held AU 0 O*	Combining Latin Small Letter O
0367	uͧo	*Held AU 0 U*	Combining Latin Small Letter U
0368	cͨo	*Held AU 0 C*	Combining Latin Small Letter C
0369	dͩo	*Held AU 0 D*	Combining Latin Small Letter D
036A	hͪo	*Held AU 0 H*	Combining Latin Small Letter H
036B	mͫo	*Held AU 0 M*	Combining Latin Small Letter M
036C	rͬo	*Held AU 0 R*	Combining Latin Small Letter R
036D	tͭo	*Held AU 0 T*	Combining Latin Small Letter T
036E	vͮo	*Held AU 0 V*	Combining Latin Small Letter V
036F	xͯo	*Held AU 0 X*	Combining Latin Small Letter X
0483	o҃	*Held AL W -*	Combining Cyrillic Titlo
0484	o҄	*Held AL W :*	Combining Cyrillic Palatalization
0485	o҅	*Held AL W `*	Combining Cyrillic Dasia Pneumata
0486	o҆	*Held AL W '*	Combining Cyrillic Psili Pneumata
0487	o҇	*Held AL W 9*	Combining Cyrillic Pokrytie
1DC4	o᷄	*Held AL - /*	Combining Macron-Acute
1DC5	o᷅	*Held AL \ -*	Combining Grave-Macron
1DC6	o᷆	*Held AL - *	Combining Macron-Grave
1DC7	o᷇	*Held AL / -*	Combining Acute-Macron
1DC8	o᷈	*Held AL ` '*	Combining Grave-Acute-Grave

1DC9	◌᷉	*Held AL ' `*	Combining Acute-Grave-Acute
1DCA	◌ᵣ	*Held AL ` R*	Combining Latin Small Letter R Below
1DCB	◌᷄	Dead AL 0 =	Combining Breve-Macron
1DCC	◌᷅	Dead AL = 0	Combining Macron-Breve
1DCD	◌᷆	*Held AU 6 6*	Combining Double Circumflex Above
1DCE	◌᷇	Dead AL 5 5	Combining Ogonek Above
1DD8	◌᷈	*Held AU 8 D*	Combining Latin Small Letter Insular D
1DFE	◌᷾	Dead AL : ,	Combining Left Arrowhead Above
20D0	◌⃐	Dead AL 8 ,	Combining Left Harpoon Above
20D1	◌⃑	Dead AL 8 .	Combining Right Harpoon Above
20D2	◌⃒	Dead AU \ \	Combining Long Vertical Line Overlay
20D6	◌⃖	*Held AL 8 ,*	Combining Left Arrow Above
20D7	◌⃗	*Held AL 8 .*	Combining Right Arrow Above
20DB	◌⃛	*Held AL : 3*	Combining Three Dots Above
20DC	◌⃜	*Held AL : 4*	Combining Four Dots Above
20E1	◌⃡	*Held AL 8 /*	Combining Left Right Arrow Above
20E5	◌⃥	Dead AL \ \	Combining Reverse Solidus Overlay
20E6	◌⃦	*Held AU \ *	Combining Double Vertical Stroke Overlay
20E9	◌⃩	*Held AL [ ]*	Combining Wide Bridge Above
20F0	◌⃰	Dead AL 6 8	Combining Asterisk Above

Modifier letter guide

The next sections list every Modifier Letter on the Q Keyboard. See Modifier Letters for additional information.

In the Dead Key guides, modifiers are shown as black letters with a medium blue background, like this example from Dead Key M:

d	**D**	**0256**	ɖ	**0189**	Ð	**1D48**	ᵈ	**1D30**	ᴰ

In a Dead Key guide, you can distinguish a Modifier Letter from other highlighted letters because you will you will **not** see the letter **o** or the ◌ symbol that is present for **combining** modifiers.

Held Keys shown below in **red** are pressed while the ***AA key is being held down***. **Dead Keys** shown below in **black with a light blue background** are a reminder to *release* **AA** *before* pressing Key 2 for that symbol.

Literal symbols using **Spacebar** are typed in the same manner as **AL Dead Keys**. Hold **AA**, type indicated key then spacebar. A small number of Literals are typed using **AL/BL**. This is discussed in the Literals article and in Understanding modifier key notation.

Only characters containing a Unicode description of "Modifier Letter" appear below.

> For instance, the Breve-like symbol **U+1D55** ᵕ is described as "Modifier Letter Small Bottom Half O". However, the Breve literal ˘ on **AA) SP** at **U+02D8** in the Unicode block of "Spacing Modifier Letters" is simply called "**Breve**". So, this symbol does **not** appear in the Modifier tables.

Most symbols on the Q Keyboard which don't contain "Modifier" in their Unicode description are "Literal" symbols produced with the Spacebar or **AL/BL**. Consult the Dead Key guide for the literals that are available on any particular Dead Key.

Notes:

- **U+A71A Modifier Letter Lower Right Corner Angle** is rendered with an incorrect glyph in Roman Cyrillic Std font. (Symbol is shown below correctly in Calibri.) **Update**: As of February 2019 the most recent version of Roman Cyrillic Std renders this correctly.

- **U+02C9 Modifier Letter Macron** is on ***Held Key AU = =*** • There is a similar symbol **U+00AF Macron** defined as the Literal for **Dead Key 0C** (the **=** key). To produce the Macron *literal*, type **AA =** and then the Spacebar.

  For literals, it doesn't matter whether or not you hold **AA** or Shift while typing

Spacebar.

- **U+AB5C Modifier Letter Small Heng** may not display in some versions of Windows Help.

- There is no Unicode entry defined for "**Modifier Letter Small N**". However, in most fonts, this function is served by **U+207F Superscript Latin Letter Small N**, which can be found on ***Held AL M N***

Modifier letters by Description

Modifier Letters in order by Description

U+	Sym	Keys	Description
02CA	ˊ	HELD AU ' '	Modifier Letter Acute Accent
02BC	'	DEAD AL . ,	Modifier Letter Apostrophe
02BC	'	HELD AL] '	Modifier Letter Apostrophe
02F9	˥	DEAD AL 7 [	Modifier Letter Begin High Tone
02FB	˩	HELD AL 7 [	Modifier Letter Begin Low Tone
1D2C	A	HELD AU M A	Modifier Letter Capital A
1D2E	B	HELD AU M B	Modifier Letter Capital B
1D30	D	HELD AU M D	Modifier Letter Capital D
1D31	E	HELD AU M E	Modifier Letter Capital E
1D33	G	HELD AU M G	Modifier Letter Capital G
1D34	H	HELD AU M H	Modifier Letter Capital H
A7F8	Ꞿ	HELD AU - H	Modifier Letter Capital H with Stroke
1D35	I	HELD AU M I	Modifier Letter Capital I
1D36	J	HELD AU M J	Modifier Letter Capital J
1D37	K	HELD AU M K	Modifier Letter Capital K
1D38	L	HELD AU M L	Modifier Letter Capital L
1D39	M	HELD AU M M	Modifier Letter Capital M
1D3A	N	HELD AU M N	Modifier Letter Capital N
1D3C	O	HELD AU M O	Modifier Letter Capital O
1D3E	P	HELD AU M P	Modifier Letter Capital P
1D3F	R	HELD AU M R	Modifier Letter Capital R
1D40	T	HELD AU M T	Modifier Letter Capital T
1D41	U	HELD AU M U	Modifier Letter Capital U
2C7D	V	HELD AU M V	Modifier Letter Capital V
1D42	W	HELD AU M W	Modifier Letter Capital W
02D3	˂	HELD AL 8 [	Modifier Letter Centred Left Half Ring
02D2	˃	HELD AL 8]	Modifier Letter Centred Right Half Ring

02C6	ˆ	DEAD AL 6 SP	Modifier Letter Circumflex Accent
02C6	ˆ	AL [BL [	Modifier Letter Circumflex Accent
A789	꞉	DEAD AL M :	Modifier Letter Colon
02DF	˟	*HELD AU X X*	Modifier Letter Cross Accent
1D78	ᵸ	*HELD AL = H*	Modifier Letter Cyrillic En
A69C	ꚜ	*HELD AL = B*	Modifier Letter Cyrillic Hard Sign
A69D	ꚝ	*HELD AL = 6*	Modifier Letter Cyrillic Soft Sign
A719	˸	*HELD AL . -*	Modifier Letter Dot Horizontal Bar
A718	˹	*HELD AL . /*	Modifier Letter Dot Slash
A717	˺	*HELD AL . *	Modifier Letter Dot Vertical Bar
02EE	ˮ	*HELD AL] :*	Modifier Letter Double Apostrophe
02BA	″	*HELD AL M '*	Modifier Letter Double Prime
02C5	˅	*HELD AL M .*	Modifier Letter Down Arrowhead
02D5	ˡ	*HELD AL / [*	Modifier Letter Down Tack
02FA	˚	DEAD AL 7]	Modifier Letter End High Tone
02FC	˛	*HELD AL 7]*	Modifier Letter End Low Tone
02E5	˥	*HELD AL - 1*	Modifier Letter Extra-High Tone Bar
02E9	˩	*HELD AL - 5*	Modifier Letter Extra-Low Tone Bar
02C0	ˀ	DEAD AL 7 SP	Modifier Letter Glottal Stop
02C0	ˀ	DEAD AL 9]	Modifier Letter Glottal Stop
02CB	ˋ	DEAD AL ` SP	Modifier Letter Grave Accent
02D1	ˑ	DEAD AL X '	Modifier Letter Half Triangular Colon
02E6	˦	*HELD AL - 2*	Modifier Letter High Tone Bar
02C2	˂	DEAD AL M ,	Modifier Letter Left Arrowhead
02BF	˿	DEAD AL 8 [	Modifier Letter Left Half Ring
02CF	ˏ	*HELD AU ' :*	Modifier Letter Low Acute Accent
02CF	ˏ	AL ' BL '	Modifier Letter Low Acute Accent
A788	ˬ	DEAD AL [SP	Modifier Letter Low Circumflex Accent
A788	ˬ	AL 6 BL 6	Modifier Letter Low Circumflex Accent
02EF	˯	*HELD AL ' .*	Modifier Letter Low Down Arrowhead
02CE	ˎ	AL ` BL `	Modifier Letter Low Grave Accent

02F1	˲	DEAD AL ' ,	Modifier Letter Low Left Arrowhead
02CD	ˍ	AL = BL =	Modifier Letter Low Macron
02F2	˳	DEAD AL ' .	Modifier Letter Low Right Arrowhead
02F3	˺	AL 8 BL 8	Modifier Letter Low Ring
02F7	˷	DEAD AL 2 SP	Modifier Letter Low Tilde
02F7	˷	AL 1 BL 1	Modifier Letter Low Tilde
02E8	˨	HELD AL - 4	Modifier Letter Low Tone Bar
02F0	˰	HELD AL ' ,	Modifier Letter Low Up Arrowhead
02CC	ˌ	HELD AL - :	Modifier Letter Low Vertical Line
A71A	˵	HELD AL . 6	Modifier Letter Lower Right Corner Angle
02C9	ˉ	HELD AU = =	Modifier Letter Macron
02E7	˧	HELD AL - 3	Modifier Letter Mid Tone Bar
02F6	˶	DEAD AL 3 SP	Modifier Letter Middle Double Acute Accent
02F5	˵	AL 3 BL 3	Modifier Letter Middle Double Grave Accent
02F4	˴	DEAD AL M `	Modifier Letter Middle Grave Accent
02D7	˗	HELD AL 2 -	Modifier Letter Minus Sign
02D6	˖	HELD AL 2 =	Modifier Letter Plus Sign
02B9	ʹ	DEAD AL M '	Modifier Letter Prime
02F8	˸	DEAD AL 6 :	Modifier Letter Raised Colon
A71C	↓	HELD AL 6 .	Modifier Letter Raised Down Arrow
A71B	↑	HELD AL 6 ,	Modifier Letter Raised Up Arrow
02BD	ʽ	HELD AL [:	Modifier Letter Reversed Comma
02C1	ˁ	DEAD AL 9 [	Modifier Letter Reversed Glottal Stop
02DE	˞	HELD AL , R	Modifier Letter Rhotic Hook
02C3	˃	DEAD AL M .	Modifier Letter Right Arrowhead
02BE	ʾ	DEAD AL 8]	Modifier Letter Right Half Ring
02FD	˽	HELD AL 6]	Modifier Letter Shelf
A78A	꞉	HELD AU - =	Modifier Letter Short Equals Sign
1D43	ᵃ	HELD AL M A	Modifier Letter Small A
1D45	ᵅ	HELD AL M Q	Modifier Letter Small Alpha
1D47	ᵇ	HELD AL M B	Modifier Letter Small B

1D5D	ᵝ	DEAD AL 9 B	Modifier Letter Small Beta
1D55	ᵕ	AL 0 BL 0	Modifier Letter Small Bottom Half O
1D9C	ᶜ	*HELD AL M C*	Modifier Letter Small C
02B6	ʶ	*HELD AL ' R*	Modifier Letter Small Capital Inverted R
1DB0	ᴺ	*HELD AU \ N*	Modifier Letter Small Capital N
1D61	ᵡ	*HELD AL 4 X*	Modifier Letter Small Chi
1D48	ᵈ	*HELD AL M D*	Modifier Letter Small D
1D5F	ᵟ	*HELD AL 9 D*	Modifier Letter Small Delta
1D49	ᵉ	*HELD AL M E*	Modifier Letter Small E
1D51	ᵑ	*HELD AU 9 N*	Modifier Letter Small Eng
1D9E	ᶞ	*HELD AU 9 D*	Modifier Letter Small Eth
1DA0	ᶠ	*HELD AL M F*	Modifier Letter Small F
1D4D	ᵍ	*HELD AL M G*	Modifier Letter Small G
02E0	ˠ	DEAD AL 1 G	Modifier Letter Small Gamma
1D5E	ᵞ	*HELD AL 4 G*	Modifier Letter Small Greek Gamma
1D60	ᵠ	*HELD AL 4 0*	Modifier Letter Small Greek Phi
02B0	ʰ	*HELD AL M H*	Modifier Letter Small H
02B1	ʱ	DEAD AL ` H	Modifier Letter Small H with Hook
AB5C	ꭜ	*HELD AL ` H*	Modifier Letter Small Heng
02B2	ʲ	*HELD AL M J*	Modifier Letter Small J
1D4F	ᵏ	*HELD AL M K*	Modifier Letter Small K
02E1	ˡ	*HELD AL M L*	Modifier Letter Small L
1D50	ᵐ	*HELD AL M M*	Modifier Letter Small M
1DAC	ᶬ	*HELD AU X M*	Modifier Letter Small M with Hook
1DAE	ᶮ	*HELD AU X N*	Modifier Letter Small N with Left Hook
1DAF	ᶯ	*HELD AU 7 N*	Modifier Letter Small N with Retroflex Hook
1D52	ᵒ	*HELD AL M O*	Modifier Letter Small O
1D4B	ᵋ	*HELD AL M [*	Modifier Letter Small Open E
1D53	ᵓ	*HELD AL M]*	Modifier Letter Small Open O
1D56	ᵖ	*HELD AL M P*	Modifier Letter Small P
1DB2	ᶲ	*HELD AL 4 F*	Modifier Letter Small Phi
02B3	ʳ	*HELD AL M R*	Modifier Letter Small R

02E4	ˤ	DEAD AL 9 \	Modifier Letter Small Reversed Glottal Stop
1D9F	ɜ	*HELD AL M *	Modifier Letter Small Reversed Open E
02E2	ˢ	*HELD AL M S*	Modifier Letter Small S
1DB3	ˢ	*HELD AU 9 S*	Modifier Letter Small S with Hook
1D4A	ə	*HELD AL M `*	Modifier Letter Small Schwa
1DA2	ᵍ	*HELD AU 9 G*	Modifier Letter Small Script G
1D57	ᵗ	*HELD AL M T*	Modifier Letter Small T
1DBF	ᶿ	*HELD AL 4 U*	Modifier Letter Small Theta
1D54	ᵒ	DEAD AL 9 SP	Modifier Letter Small Top Half O
1D4E	ᵎ	*HELD AL 0 J*	Modifier Letter Small Turned I
02B4	ʴ	*HELD AL 6 R*	Modifier Letter Small Turned R
02B5	ʵ	*HELD AL 2 R*	Modifier Letter Small Turned R with Hook
1D58	ᵘ	*HELD AL M U*	Modifier Letter Small U
1DB7	ᶹ	*HELD AL 9 Y*	Modifier Letter Small Upsilon
1D5B	ᵛ	*HELD AL M V*	Modifier Letter Small V
02B7	ʷ	*HELD AL M W*	Modifier Letter Small W
02E3	ˣ	*HELD AL M X*	Modifier Letter Small X
02B8	ʸ	*HELD AL M Y*	Modifier Letter Small Y
1DBB	ᶻ	*HELD AL M Z*	Modifier Letter Small Z
02D0	ˑ	DEAD AL X :	Modifier Letter Triangular Colon
02BB	ʻ	*HELD AL , .*	Modifier Letter Turned Comma
02BB	ʻ	*HELD AL . ,*	Modifier Letter Turned Comma
02BB	ʻ	*HELD AL ['*	Modifier Letter Turned Comma
02ED	˭	DEAD AL M -	Modifier Letter Unaspirated
02C4	˄	*HELD AL M ,*	Modifier Letter Up Arrowhead
02D4	˔	*HELD AL /]*	Modifier Letter Up Tack
02C8	ˈ	DEAD AL - :	Modifier Letter Vertical Line
02EC	ˬ	AL] BL]	Modifier Letter Voicing

Modifier letters by Unicode

Modifier Letters in order by Unicode value

U+	Sym	Keys	Description
02B0	ʰ	*HELD AL M H*	Modifier Letter Small H
02B1	ʱ	DEAD AL ` H	Modifier Letter Small H with Hook
02B2	ʲ	*HELD AL M J*	Modifier Letter Small J
02B3	ʳ	*HELD AL M R*	Modifier Letter Small R
02B4	ʴ	*HELD AL 6 R*	Modifier Letter Small Turned R
02B5	ʵ	*HELD AL 2 R*	Modifier Letter Small Turned R with Hook
02B6	ʶ	*HELD AL ' R*	Modifier Letter Small Capital Inverted R
02B7	ʷ	*HELD AL M W*	Modifier Letter Small W
02B8	ʸ	*HELD AL M Y*	Modifier Letter Small Y
02B9	ʹ	DEAD AL M '	Modifier Letter Prime
02BA	ʺ	*HELD AL M '*	Modifier Letter Double Prime
02BB	ʻ	*HELD AL , .*	Modifier Letter Turned Comma
02BB	ʻ	*HELD AL . ,*	Modifier Letter Turned Comma
02BB	ʻ	*HELD AL ['*	Modifier Letter Turned Comma
02BC	ʼ	DEAD AL . ,	Modifier Letter Apostrophe
02BC	ʼ	*HELD AL] '*	Modifier Letter Apostrophe
02BD	ʽ	*HELD AL [:*	Modifier Letter Reversed Comma
02BE	ʾ	DEAD AL 8]	Modifier Letter Right Half Ring
02BF	ʿ	DEAD AL 8 [	Modifier Letter Left Half Ring
02C0	ˀ	DEAD AL 7 SP	Modifier Letter Glottal Stop
02C0	ˀ	DEAD AL 9]	Modifier Letter Glottal Stop
02C1	ˁ	DEAD AL 9 [	Modifier Letter Reversed Glottal Stop
02C2	˂	DEAD AL M ,	Modifier Letter Left Arrowhead
02C3	˃	DEAD AL M .	Modifier Letter Right Arrowhead
02C4	˄	*HELD AL M ,*	Modifier Letter Up Arrowhead
02C5	˅	*HELD AL M .*	Modifier Letter Down Arrowhead

02C6	ˆ	DEAD AL 6 SP	Modifier Letter Circumflex Accent
02C6	ˆ	AL [BL [	Modifier Letter Circumflex Accent
02C8	ˈ	DEAD AL - :	Modifier Letter Vertical Line
02C9	ˉ	*HELD AU = =*	Modifier Letter Macron
02CA	ˊ	*HELD AU ' '*	Modifier Letter Acute Accent
02CB	ˋ	DEAD AL ` SP	Modifier Letter Grave Accent
02CC	ˌ	*HELD AL - :*	Modifier Letter Low Vertical Line
02CD	ˍ	AL = BL =	Modifier Letter Low Macron
02CE	ˎ	AL ` BL `	Modifier Letter Low Grave Accent
02CF	ˏ	*HELD AU ' :*	Modifier Letter Low Acute Accent
02CF	ˏ	AL ' BL '	Modifier Letter Low Acute Accent
02D0	ː	DEAD AL X :	Modifier Letter Triangular Colon
02D1	ˑ	DEAD AL X '	Modifier Letter Half Triangular Colon
02D2	˒	*HELD AL 8]*	Modifier Letter Centred Right Half Ring
02D3	˓	*HELD AL 8 [*	Modifier Letter Centred Left Half Ring
02D4	˔	*HELD AL /]*	Modifier Letter Up Tack
02D5	˕	*HELD AL / [*	Modifier Letter Down Tack
02D6	˖	*HELD AL 2 =*	Modifier Letter Plus Sign
02D7	˗	*HELD AL 2 -*	Modifier Letter Minus Sign
02DE	˞	*HELD AL , R*	Modifier Letter Rhotic Hook
02DF	˟	*HELD AU X X*	Modifier Letter Cross Accent
02E0	ˠ	DEAD AL 1 G	Modifier Letter Small Gamma
02E1	ˡ	*HELD AL M L*	Modifier Letter Small L
02E2	ˢ	*HELD AL M S*	Modifier Letter Small S
02E3	ˣ	*HELD AL M X*	Modifier Letter Small X
02E4	ˤ	DEAD AL 9 \	Modifier Letter Small Reversed Glottal Stop
02E5	˥	*HELD AL - 1*	Modifier Letter Extra-High Tone Bar
02E6	˦	*HELD AL - 2*	Modifier Letter High Tone Bar
02E7	˧	*HELD AL - 3*	Modifier Letter Mid Tone Bar
02E8	˨	*HELD AL - 4*	Modifier Letter Low Tone Bar
02E9	˩	*HELD AL - 5*	Modifier Letter Extra-Low Tone Bar

02EC	ˬ	AL] BL]	Modifier Letter Voicing
02ED	˭	DEAD AL M -	Modifier Letter Unaspirated
02EE	ˮ	*HELD AL] :*	Modifier Letter Double Apostrophe
02EF	˯	*HELD AL ' .*	Modifier Letter Low Down Arrowhead
02F0	˰	*HELD AL ' ,*	Modifier Letter Low Up Arrowhead
02F1	˱	DEAD AL ' ,	Modifier Letter Low Left Arrowhead
02F2	˲	DEAD AL ' .	Modifier Letter Low Right Arrowhead
02F3	˳	AL 8 BL 8	Modifier Letter Low Ring
02F4	˴	DEAD AL M `	Modifier Letter Middle Grave Accent
02F5	˵	AL 3 BL 3	Modifier Letter Middle Double Grave Accent
02F6	˶	DEAD AL 3 SP	Modifier Letter Middle Double Acute Accent
02F7	˷	DEAD AL 2 SP	Modifier Letter Low Tilde
02F7	˷	AL 1 BL 1	Modifier Letter Low Tilde
02F8	˸	DEAD AL 6 :	Modifier Letter Raised Colon
02F9	˹	DEAD AL 7 [	Modifier Letter Begin High Tone
02FA	˺	DEAD AL 7]	Modifier Letter End High Tone
02FB	˻	*HELD AL 7 [*	Modifier Letter Begin Low Tone
02FC	˼	*HELD AL 7]*	Modifier Letter End Low Tone
02FD	˽	*HELD AL 6]*	Modifier Letter Shelf
1D2C	A	*HELD AU M A*	Modifier Letter Capital A
1D2E	B	*HELD AU M B*	Modifier Letter Capital B
1D30	D	*HELD AU M D*	Modifier Letter Capital D
1D31	E	*HELD AU M E*	Modifier Letter Capital E
1D33	G	*HELD AU M G*	Modifier Letter Capital G
1D34	H	*HELD AU M H*	Modifier Letter Capital H
1D35	I	*HELD AU M I*	Modifier Letter Capital I
1D36	J	*HELD AU M J*	Modifier Letter Capital J
1D37	K	*HELD AU M K*	Modifier Letter Capital K
1D38	L	*HELD AU M L*	Modifier Letter Capital L
1D39	M	*HELD AU M M*	Modifier Letter Capital M
1D3A	N	*HELD AU M N*	Modifier Letter Capital N

1D3C	ᴼ	HELD AU M O	Modifier Letter Capital O
1D3E	ᴾ	HELD AU M P	Modifier Letter Capital P
1D3F	ᴿ	HELD AU M R	Modifier Letter Capital R
1D40	ᵀ	HELD AU M T	Modifier Letter Capital T
1D41	ᵁ	HELD AU M U	Modifier Letter Capital U
1D42	ᵂ	HELD AU M W	Modifier Letter Capital W
1D43	ᵃ	HELD AL M A	Modifier Letter Small A
1D45	ᵅ	HELD AL M Q	Modifier Letter Small Alpha
1D47	ᵇ	HELD AL M B	Modifier Letter Small B
1D48	ᵈ	HELD AL M D	Modifier Letter Small D
1D49	ᵉ	HELD AL M E	Modifier Letter Small E
1D4A	ᵊ	HELD AL M `	Modifier Letter Small Schwa
1D4B	ᵋ	HELD AL M [	Modifier Letter Small Open E
1D4D	ᵍ	HELD AL M G	Modifier Letter Small G
1D4E	ᵎ	HELD AL 0 J	Modifier Letter Small Turned I
1D4F	ᵏ	HELD AL M K	Modifier Letter Small K
1D50	ᵐ	HELD AL M M	Modifier Letter Small M
1D51	ᵑ	HELD AU 9 N	Modifier Letter Small Eng
1D52	ᵒ	HELD AL M O	Modifier Letter Small O
1D53	ᵓ	HELD AL M]	Modifier Letter Small Open O
1D54	ᵔ	DEAD AL 9 SP	Modifier Letter Small Top Half O
1D55	ᵕ	AL 0 BL 0	Modifier Letter Small Bottom Half O
1D56	ᵖ	HELD AL M P	Modifier Letter Small P
1D57	ᵗ	HELD AL M T	Modifier Letter Small T
1D58	ᵘ	HELD AL M U	Modifier Letter Small U
1D5B	ᵛ	HELD AL M V	Modifier Letter Small V
1D5D	ᵝ	DEAD AL 9 B	Modifier Letter Small Beta
1D5E	ᵞ	HELD AL 4 G	Modifier Letter Small Greek Gamma
1D5F	ᵟ	HELD AL 9 D	Modifier Letter Small Delta
1D60	ᵠ	HELD AL 4 0	Modifier Letter Small Greek Phi
1D61	ᵡ	HELD AL 4 X	Modifier Letter Small Chi
1D78	ᴴ	HELD AL = H	Modifier Letter Cyrillic En

1D9C	ᶜ	*HELD AL M C*	Modifier Letter Small C
1D9E	ᶞ	*HELD AU 9 D*	Modifier Letter Small Eth
1D9F	ᶟ	*HELD AL M *	Modifier Letter Small Reversed Open E
1DA0	ᶠ	*HELD AL M F*	Modifier Letter Small F
1DA2	ᶢ	*HELD AU 9 G*	Modifier Letter Small Script G
1DAC	ᶬ	*HELD AU X M*	Modifier Letter Small M with Hook
1DAE	ᶮ	*HELD AU X N*	Modifier Letter Small N with Left Hook
1DAF	ᶯ	*HELD AU 7 N*	Modifier Letter Small N with Retroflex Hook
1DB0	ᶰ	*HELD AU \ N*	Modifier Letter Small Capital N
1DB2	ᶲ	*HELD AL 4 F*	Modifier Letter Small Phi
1DB3	ᶳ	*HELD AU 9 S*	Modifier Letter Small S with Hook
1DB7	ᶷ	*HELD AL 9 Y*	Modifier Letter Small Upsilon
1DBB	ᶻ	*HELD AL M Z*	Modifier Letter Small Z
1DBF	ᶿ	*HELD AL 4 U*	Modifier Letter Small Theta
2C7D	ⱽ	*HELD AU M V*	Modifier Letter Capital V
A69C	ꚜ	*HELD AL = B*	Modifier Letter Cyrillic Hard Sign
A69D	ꚝ	*HELD AL = 6*	Modifier Letter Cyrillic Soft Sign
A717	ꜗ	*HELD AL . *	Modifier Letter Dot Vertical Bar
A718	ꜘ	*HELD AL . /*	Modifier Letter Dot Slash
A719	ꜙ	*HELD AL . -*	Modifier Letter Dot Horizontal Bar
A71A	ꜚ	*HELD AL . 6*	Modifier Letter Lower Right Corner Angle
A71B	ꜛ	*HELD AL 6 ,*	Modifier Letter Raised Up Arrow
A71C	ꜜ	*HELD AL 6 .*	Modifier Letter Raised Down Arrow
A788	ˬ	DEAD AL [SP	Modifier Letter Low Circumflex Accent
A788	ˬ	AL 6 BL 6	Modifier Letter Low Circumflex Accent
A789	˸	DEAD AL M :	Modifier Letter Colon
A78A	꞉	*HELD AU - =*	Modifier Letter Short Equals Sign
A7F8	ꟸ	*HELD AU - H*	Modifier Letter Capital H with Stroke
AB5C	ꭜ	*HELD AL ` H*	Modifier Letter Small Heng

Early-Shift vs. Late-Shift

The following is an in-depth explanation of Early-Shift vs. Late-Shift.

For a brief summary of this information, see Capitalization rules.

Important Notes:

- The discussion below only applies to **Dead Keys and *Held Keys***. For upper-case **Live Keys** that use Shift, you must hold the Shift along with AA, BB or CC prior to typing the final key. (The Live Key chords for BC *imply* upper-case, but do not actually use Shift. See Live Key Chords for more information.) In that sense, all shifted Live Keys behave as though they were "Early Shift". When you use a Shift with AA, BB or CC (or any combination of them), the order you press these modifiers is not important. For instance, to use CC+Shift you could press CC first then Shift, or Shift then CC, or press them both at the same time, and they will all work correctly.

- Converting letters between upper and lower case is commonly done in text editors and word processors. See the discussion below for a note about this.

- This article concerns the interaction of the Shift and Caps Lock keys on the Q Keyboard. If you are using a hardware-defined keyboard, you may also have a **Shift Lock** available. See the discussion below for information about how a proposed **Shift Lock** might operate. Hardware-defined keyboards do not as yet exist.

A conventional Dead Key keyboard requires you to select the diacritic accent first, and then if you need the final character to be in upper case, you press the Shift key **after** the introducer sequence, but before typing the final letter key. When the Shift key is used in this way, we call it a **Late Shift**.

Typing Dead Keys with Late Shift respects the Caps Lock state, so if you needed to type several upper-case accented letters as Dead Keys, you can enable Caps Lock without having to individually press the Shift key for each letter. The Q Keyboard can be operated this way, in Late Shift mode. Users familiar with Dead Keys on other international keyboards may wish to type this way when first learning the Q Keyboard, since it will be similar to what they are used to.

The Q Keyboard also allows you to press the Shift **with** the AA modifier when typing the desired diacritic key. This gives you a means of deciding **beforehand** if the final character you want to produce is to be upper case. When you do this, the keyboard essentially 'remembers' that you held down the Shift key at first, when the other keys of the introducer sequence were being typed.

Typing this way is called using an **Early Shift**.

Using **Early Shift** has the following consequences:

- When you type the final data key, Caps Lock will be ignored, and the given letter will **always** appear in upper case, as if you had held down a Shift key in Late Shift mode. The reason this is done is that if you intentionally pressed an early Shift key with a Dead Key introducer, you have explicitly indicated that you **wanted** the final character to be in upper case. When you do that, your request is honored.

- Early Shift also applies its shifting to non-alphabetic symbols. (Just as in conventional keyboards, keys like **4 $** do not have not letters as base symbols, and so are **not affected by Caps Lock**.)

- If you use Early Shift, you could also use Late Shift by continuing to hold down the Shift key, if you wanted to. Using a Late Shift for the final key in addition to an Early Shift for the introducer sequence is not necessary, and will not change the outcome, but it will work correctly if you do it. You may wish to hold down the Shift key in this way for the entire sequence, so that it won't be necessary to think about releasing the Shift in the middle of what you are doing. That makes the typing task for this kind of key sequence a bit less complicated and distracting. Each typist will find the method that works best for them.

- To describe the situation where you continue to hold the Shift key through the entire process, as if combining both Early Shift and Late Shift, we refer to this as a **Full Shift**. For **Dead Key** letters, holding the keys this way would be a little unusual, since you would have to release **AA** during the second part of the sequence, while still holding Shift. This will work, but you are unlikely to do it that way. For ***Held Keys*** letters, you must hold **AA** and Shift through the entire sequence as a Full Shift.

- If you use Full Shift when **Caps Lock** is on, the **Late** part of it will **not** reverse or undo the Caps Lock in effect. Once the **Early** part is used, you are 'committed' to producing the final letter in upper-case (or to select a shifted special character, if applicable). If you also use a Late Shift afterwards, it will not change the outcome.

Why would you want to use Early Shift? Mainly to speed up your typing. By being able to combine the **AA** key with a Shift, you only need to get your "modifier fingers" into the required position once. That can help reduce the overall amount of finger-movement involved in producing a given letter. With Late Shift, you have first to locate the **AA** key, type the accent key, go back and locate the Shift key, and then type the final key. Good typists can use the Early Shift method to get their fingers in the required locations sooner, allowing them to type faster.

Some users will find advantages in using Late Shift instead of Early Shift:

- Typists familiar with Dead Keys on conventional keyboards will be accustomed to typing with Late Shift.

- The Early Shift method requires typing three keys at the same time: the **AA** key, the Shift key, and a Dead Key introducer key. Persons with strength or dexterity issues might find that Late Shift requires less overall typing effort, even though it is somewhat slower. The keys you need to use may or may not be convenient to hold at the same time.

- For Dead Keys, Late Shift will respect Caps Lock when used with letters, and will reverse the sense of Caps Lock. In contrast, Early Shift commits the final letter to being upper case, and ignores Caps Lock.

Handling of Shift and Caps Lock with Held Keys

When you need an upper case ***Held Key*** letter, you must press a Shift Key as a Full Shift and **hold it for the entire key sequence**.

A Held Key will not respect Caps Lock. If Caps Lock happened to be on, your Held Key will **ignore** it. So, if you don't use a Shift key, your Held Key letter will appear in lower case, **even when Caps Lock is on**. Test this out to confirm that you understand this issue. It may surprise you when you see it occur for the first time.

This limitation is due to the way Windows keyboard device drivers are processed, and cannot be changed. It is an aspect of the Q Keyboard that you will have to get accustomed to.

How do Early Shift and Late Shift actually work?

The way in which the Q Keyboard supports both Early Shift and Late Shift (as well as Full Shift) is different than most international keyboards. How is it done? Basically, the process involves creating duplicated entries for every possible combination of keys where an upper-case letter is required. To make this design reliable, the duplicated entries are created with specially-designed software, rather than doing so manually. Because the keyboard layout contains these duplicated entries, it reduces the total number of possible unique letters and symbols the keyboard can produce.

Does the loss of supporting all those potential extra letters work a hardship to the Q Keyboard? Not really. There are over 2400 characters supported now; pretty much everything that is reasonably useful has already been included. In any case, the convenience provided by allowing both Early Shift and Late Shift is too useful to pass up.

See "Early Shift Redundancies" in the article Q Keyboard statistics at the beginning of this Help for more information.

A note about word processors and case conversion

A common feature in word processors is to convert a block of text from upper to lower case or vice versa. If you only use that feature to work with common languages like English, Spanish or German, it should work flawlessly. When you begin to work with the hundreds of international letters available on the Q Keyboard, it is not always that simple.

You may find that some letters will not convert correctly in one direction or the other (to upper case, or to lower case). So, if you attempt to convert from lower to upper, then convert the same data from upper back to lower, you may not get the original letters you started with. The issue is described as surviving a "**round-trip**" case conversion (or not).

Problems like this can occur because the Unicode rules defining case conversion are complex and subject to change with new releases of the Unicode standard, and not all software follows those rules correctly. Converting the case of a Unicode letter is more difficult than plain ASCII data, because there is no easy way to do this mathematically in a program. ASCII letters can be converted by simple arithmetic, while Unicode letters have to be looked up individually to determine how they get converted, which requires a large case-conversion table.

There are also problems involving Greek and Greek-like Latin letters that are incorporated into mostly Latin languages. The case-conversion rules for such letters are known to have had inconsistencies in them, and those rules have not always been stable from one release of Unicode to the next. That can cause a round-trip case conversion to fail, resulting in data corruption.

If have you have a document with non-English letters and you want to perform case conversion, you are strongly advised to **save your work first**, and ***test*** the process to make sure it works correctly. If you find that conversion errors are occurring, you may need to manually alter your text. If you have experienced this problem before, you may know exactly which letters are likely to get converted incorrectly, so you may be able to use that knowledge to perform a global search-and-replace operation in your document to correct the problem. Since a global search-and-replace might replace text you didn't want changed, you would have to proceed carefully if you did this.

If you perform such tests early on and find that you are affected by this issue, you may be able to plan ahead and type the letters you need in the correct case to begin with and avoid converting them later.

Otherwise, you might be able to find a utility program that will help you convert your data. If you find such a program, be sure it has been designed specifically to support Unicode case conversion. It must also be a **recent** program, because as noted, the Unicode standard is periodically revised, including its case-conversion rules.

A note about the use of **Shift Lock**

On a hardware-defined Q Keyboard, there may be a **Shift Lock** available. The Shift Lock acts like you were continuously holding down a Shift key. That would enable you to type upper case letters of any kind without using a Shift. The main reason for including a Shift Lock is for typing all-capital letters that were on Dead Keys or Held Keys and were placed on non-letter keys. For instance, Cyrillic ж is on the [key, which is not affected by Caps Lock, thus making it inconvenient to type many such letters. If a keyboard had a Shift Lock, you would not have to hold down the Shift key or perform a case-conversion editing function.

Background about Q Keyboard shifting

This section provides some **background information** about how and why the Q Keyboard implements the shifting techniques it does, and other details. This is somewhat technical, and is not strictly necessary to understanding the preceding article.

In conventional keyboards, using Late Shift can sometimes involve additional effort, because you may also have to use Shift, Ctrl or AltGr to select among multiple diacritics on a single key. Some keyboards have keys with three or even four Dead Key accent symbols on them.

One example of this is the Finnish multilingual keyboard layout. A diagram of this keyboard can be found at https://upload.wikimedia.org/wikipedia/commons/3/35/KB_Finnish_Multilingual.svg.

When the shift state for the accent and the shift state for the final letter are not the same, it requires more finger motion and can slow down typing. Because the Q Keyboard Dead Key introducers have only one diacritic per key, it does not require such involved finger motions.

Some conventional keyboards allow certain accent diacritic keys to always be treated as Dead Keys by themselves, without requiring the use of AlGr, Shift or Ctrl. This documentation refers to that as an **Immediate Accent** key.

It might appear that the Q Keyboard is at a disadvantage, since it has no Immediate Accent keys. Their approach **seems** like such a nice, easy way to do things. Is that kind of design superior to the Q Keyboard? No.

When a conventional keyboard has a key with four types of accents, only one of them can truly be an **immediate** accent. The other accents will require an AlGr, Shift or Ctrl to access them. And there is not very much spare room on a keyboard to add dedicated Immediate Accent keys. For instance, on the well-equipped **German T2** keyboard (having almost as many Dead Keys as the Q Keyboard) only **two** immediate accents exist, which are the Circumflex and the Acute. Everything else requires a Shift or AltGr, and there are several, inconsistent methods for typing the accents that are available. The **Finnish multilingual** keyboard layout noted above also has only two immediate accents.

In contrast, every diacritic key on the Q Keyboard works exactly the same way, using the **AA** key. A side-by-side comparison would show that there is essentially no penalty for doing things the "Q Keyboard way". And because the Q Keyboard is consistent in its approach, it is easier to learn.

In addition what is noted above, the Q Keyboard has a feature that is better than

Immediate Accents, and that is its support for **Live Keys**. If you examine international keyboards with Immediate Accents, in nearly all cases the accents they provide are common ones, such as Acute, Grave, Diaeresis and Circumflex, and in a few cases the Tilde. These are the **same** kinds of accented letters that are available as Live Keys. Of course, not every possible accent of these types have Live Keys for them, but the majority of the ones you will need are there. Where you might have used an "Immediate Accent" keyboard to type an **è with Grave Accent** using an **Immediate Grave** symbol and then the **E** key, on the Q Keyboard you hold the **BB key** and press the **E** key. It is equally easy.

It is true that some international keyboards use their AltGr key in a way that is somewhat comparable to how the Q Keyboard handles Live Keys. However, the AltGr approach to their version of "live keys" generally supports only a handful of letters, while the Q Keyboard has some 480 letters and symbols available as Live Keys.

You are not giving up **any** performance or efficiency to use the Q Keyboard. Its design is competitive with other conventional Dead Key keyboards having Immediate Accents, and there is no "down-side" to it.

Is there any way that the design of Early Shift could have respected Caps Lock?

Possibly, but doing so would have complicated matters. The problem lies in what to do about a Full Shift condition. If a typist uses an Early Shift sometimes, and a Full Shift other times, right now they will get the same results. If we made it so that Early Shift respected Caps Lock, then if you kept holding Shift and ended up doing a Full Shift, the shifting during the second part of the key sequence would reverse Caps Lock. Depending on the timing of when you did or didn't release Shift, and whether you used Caps Lock or not, you would get differing results. It would be confusing, hard to learn, and hard to document.

As mentioned previously, there are some keys that cause Caps Lock to be ignored, and because that cannot be changed, it is preferable to have a strategy that works the same under as many different conditions as possible.

On hardware-defined keyboards, much of what you might want Caps Lock to accomplish could be done by using a Shift Lock. See the discussion on Shift Lock for more information.

Regional layout variants

This section describes **Regional Layout Variants**, which are Q Keyboard layouts intended for regions of the world that often use QWERTZ and AZERTY keyboard hardware. The information below should be considered as a "roadmap" of future Q Keyboard development plans.

Because the Q Keyboard software presently requires U.S. QWERTY hardware to operate on, it is expected that most users will want QWERTY-based variants, rather than QWERTZ or AZERTY variants. For that reason, the initial distribution of the Q Keyboard software **will not include QWERTZ or AZERTY variants**, until such time as user demand warrants adding support for them. When that point is reached, the other variants can be created and released quickly. since they are very minor modifications to the existing layouts.

Click here to see all of the Keyboard ID codes and their definitions.

Click here for a discussion of Private Variants.

Potential Q Keyboard users may be familiar with a variety of keyboard layouts. Besides QWERTY, other common formats are QWERTZ for Germany and eastern Europe, and AZERTY for France. There are additional non-QWERTY layouts used in some regions, but QWERTZ and AZERTY are the main alternatives.

Naturally, people prefer to keep using the layout they are familiar with, as much as possible. To address this need, **variant layouts** are provided. These variants affect the use of keys **Q**, **A**, **W**, **Z** and **Y** with respect to how QWERTY uses them:

- The QWERTZ variants exchange the roles of the **Z** and **Y** keys.
- The AZERTY variants exchange the roles of the **Q** and **A** keys, and the **W** and **Z** keys.

Diagrams of these layouts appear below.

Note:

- When operating a **software-defined Q Keyboard**, the QWERTY, QWERTZ and AZERTY variants are defined by different keyboard device drivers. You choose a particular variant with the Windows Language Bar icon, or with a Windows Logo+Spacebar key sequence.

- When operating a hardware-defined Q Keyboard, these variants would be selected using a switch or key sequence on the keyboard itself, and only one keyboard device driver is used for all of these variants. Additionally, a hardware-defined keyboard does not appropriate any existing keys, so the methods described below to circumvent the

loss of the left Windows Logo key would not be needed. Hardware-defined keyboards do not as yet exist.

Logical vs. Physical keys

Other than an exchange of roles for a few keys, the functionality of these variants is identical to the standard Q Keyboard layouts. You will be able to achieve the same results with any layout. For instance, the "**Z**" key will work identically on all keyboards. It is just a question of which physical location plays the role of the "**Z**" key.

In understanding layout variants, it may help to think in terms of "logical keys" vs. "physical keys". On a QWERTZ variant, Physical Key Y becomes Logical Key Z. Regardless of which variant is in effect, if you want to type the letter Z, you must use Logical Key Z to do it, even though the Physical Key required to do that may differ.

Persons familiar with keyboard software tools will recognize these variations as simple key remapping. Nothing more elaborate is going on.

The Q Keyboard enables regional variants as a way to obtain ***partial compatibility only***.

No other changes associated with these variants. The resulting layouts are similar **-** but not identical - to a true QWERTZ or AZERTY keyboard.

For instance, a real AZERTY keyboard relocates the **M** key from the bottom row to the middle row, and also relocates several punctuation keys. The layout variants supported by the Q Keyboard do not**. The regional variants do not relocate any keys other than the ones mentioned above.**

Because of this, the QWERTY, QWERTZ and AZERTY variants are compatible with native layouts on the **left** side of the keyboard, **from a point to the left of the U key**, but on the **right** side they are identical to a standard QWERTY layout.

Why was no effort made to be compatible on the right side of the keyboard? The different shape of most non-QWERTY Enter keys, and other factors, cause many of the right-hand punctuation keys to be in locations that greatly differ from QWERTY, so much so that users would be confused by the keys' actual functions vs. the preprinted QWERTY keycap legends. It would be difficult for most people to use.

A Q Keyboard design is identified by a 3 or 4-letter code in the form of **XYY** or **XYYV**.

The "X" position refers to the basic layout variant, as follows:

Layout	**X** code
QWERTY	Q
QWERTZ	Z
AZERTY	A

The "YY" position defines where the replacement **Windows Logo** key is to be mapped, to handle the loss of the left Windows Logo that becomes the Q Keyboard's **BB** modifier key.

For more information on this topic, see Where is my Windows Logo key?

YY Code	Location of Windows Logo replacement
IK	A new location for the Windows Logo is not provided. Use an **IK** layout if your keyboard has two Logo keys (which will be true for a "classic" PC/AT 104 layout) and you intend to use the right one for its normal purpose, ***or*** if your keyboard has only one Logo key (used as BB) and you can accept the absence of a functioning Windows Logo key.
AP	The Windows **Application** (Menu) key is remapped to be a Windows Logo key. The normal functioning of the Windows Application key will no longer be available. The function performed by this key can be done by clicking the Right Mouse Button on the active window, so the absence of the Windows Application might not adversely affect you. Some recent keyboards have a reduced inventory of keys, and this may be the only feasible choice, except for type **IK** above. In this documentation, the term "**menu**" as applied to a key **always** means the **Windows Application key**, which brings up a "context menu" for the currently running application. Programmers involved in Microsoft Windows development may be aware that the Alt key is internally referred to as a "Menu key". In the Q Keyboard documentation, a

	"Menu key" never refers to an Alt or AltGr key, but only to the Application key, which is often marked with an icon having horizontal lines and an arrowhead.
AS	Type AS is a variation on type AP. For type AS, the Windows **Application** (Menu) key is remapped to be a Windows Logo key. In addition, the **Scroll Lock** key is remapped to be the Windows Application key. The normal functioning of the Windows Application key and the Scroll Lock key will no longer be available. Use type AS when you need to put the Logo key on Application, like type AP, but also want a physical key to get the current context menu, instead of or addition to using a right mouse click for that purpose.
SL	The **Scroll Lock** key is remapped to be a Windows Logo key. The normal functioning of the Scroll Lock key will no longer be available. Scroll Lock is rarely used in Windows, so it may be a good candidate for use as the replacement Windows Logo key if a stand-alone Scroll Lock key is available.
PS	The **Print Screen** key is remapped to be a Windows Logo key. The normal functioning of the Print Screen key will no longer be available. Because loss of Print Screen functionality may be a significant inconvenience, choosing this key as the replacement Windows Logo would only be advisable if none of the other alternatives above were available.

The "V" position is reserved for future revisions of the Q Keyboard. It will contain a revision number starting with 1. The initial release of the Q Keyboard omits the V field, which may be considered 'revision 0'.

If you need to change to a non-Q Keyboard layout, click on the Windows Language Bar or use the Windows Logo + Spacebar in Windows 10.

<u>Alternative **#** layouts</u>

As a **convenience**, you may choose to install a second, **alternative** keyboard layout containing a name as shown above plus a suffix of "**#**" in place of the "**V**" position.

- These alternative layouts are associated with a particular layout type. They are available for most, but **not all** basic layout types. See notes in the table below for more information.

- The purpose of a "**#**" alternative is to provide a normal layout without any of the Q Keyboard extensions, but with a remapped Windows Logo key location. That will allow you to swap layouts by using the same substitute Logo key, whether the Q Keyboard features are enabled or not.

- The QWERTZ and AZERTY # layouts have their additional letter keys relocated as needed, so that those keys are in the same positions in both versions.

- The "**#**" layouts are creating by copying a standard QWERTY layout from Windows and then remapping one of its keys as a new or additional Logo key. They are installed at the same time the Q Keyboard itself is.

- For PS layouts, the Print Screen key gets remapped as a Windows Logo. If the "#" layouts for them also remapped the Print Screen key, you would be unable to do a Print Screen function. Instead, the alternate layouts for PS have a normal Print Screen key. To return to using Q Keyboard features, you have to swap keyboards using the Windows Language Bar icon, not the Logo key, since none is available.

- **Installation and use of alternative "#" layouts is optional**. If you plan to use the Q Keyboard as your primary or only keyboard layout, you may not need an alternative "**#**" layout.

Main Type	Alt Type	Notes
QIK	-	Alt layout not needed. Swap between QIK and standard U.S. QWERTY via real Logo or Windows Language Bar icon.
QAP	QAP#	Alt layout remaps Application key as Logo.
QAS	QAS#	Alt layout remaps Application key as Logo, but does not remap Scroll Lock as Application. QAS# functions identically to QAP#.
QSL	QSL#	Alt layout remaps Scroll Lock as Logo.
QPS	-	A QPS# layout could not remap Print

		Screen key as Logo, because it would prevent normal Print Screen operation. Thus, QPS# layout is not feasible. Swap between QPS and standard U.S. QWERTY via Windows Language Bar icon.
ZIK	ZIK#	Alt layout remaps Y/Z but does not remap Logo. Swap between ZIK and ZIK# via real Logo or Windows Language Bar icon.
ZAP	ZAP#	Alt layout remaps Y/Z and Application key as Logo.
ZAS	ZAS#	Alt layout remaps Y/Z and Application key as Logo, but does not remap Scroll Lock as Application. ZAS# functions identically to ZAP#.
ZSL	ZSL#	Alt layout remaps Y/Z and Scroll Lock as Logo.
ZPS	ZPS#	Alt layout remaps Y/Z but does not remap Logo. Swap between ZPS and ZPS# via Windows Language Bar icon.
AIK	AIK#	Alt layout remaps Q/A and W/Z but does not remap Logo. Swap between AIK and AIK# via real Logo or Windows Language Bar icon.
AAP	AAP#	Alt layout remaps Q/A and W/Z and Application key as Logo.
AAS	AAS#	Alt layout remaps Q/A and W/Z and Application key as Logo, but does not remap Scroll Lock as Application. AAS# functions identically to AAP#.
ASL	ASL#	Alt layout remaps Q/A and W/Z and Scroll Lock as Logo.
APS	APS#	Alt layout remaps Q/A and W/Z but does not remap Logo. Swap between APS and APS# via Windows Language Bar icon.

Private Variants

In some cases, individuals or groups might request a "Private Variant" keyboard, which

incorporates customizations useful to them but perhaps not of general interest. If and when this were done, a custom Q Keyboard design would be identified by a 5-letter code in the form **XYYVP**, where **X**, **YY** and **V** are the same as above, and **P** is an additional letter, determined on an as-needed basis. A Private Variant ID will always contain a **V** field. Presently, no Private Variant keyboards exist.

For users wanting to create a Private Variant with additional characters that did not disrupt the current design, one possibility is to use the **numeric keypad**. The keypad **+ – *** and **/** keys are fully programmable using the existing Q Keyboard technology, do not interact with the Num Lock key and would not be misinterpreted (like numeric pad Enter might be). These four keys could be made into **Live Keys**, with the same capabilities as other Live Keys. At present, the Q Keyboard does not exploit the numeric keypad.

Users interested in Private Variant customizations are invited to contact the author.

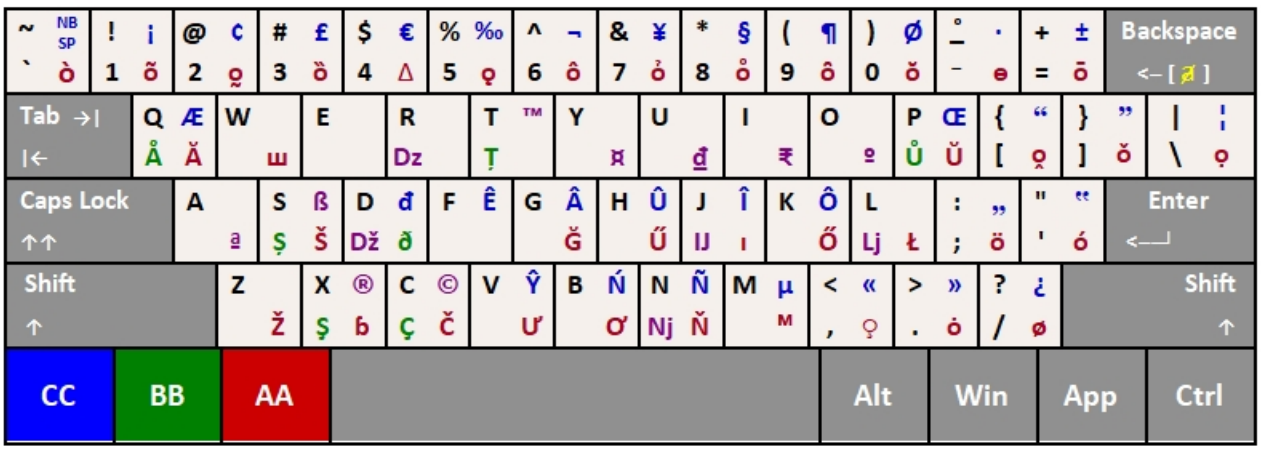
Keyboard variant diagrams

Here are diagrams of each variant layout, to help you visualize how they would appear and operate in practice. Keys repositioned from QWERTY are shown in yellow background.

As can be seen, these layout variants provide only **partial** compatibility with true QWERTZ and AZERTY keyboards.

It may also be observed that this partial compatibility does not involve a very extensive change from QWERTY. Because of this, it is expected that a number of users may conclude that it is simpler to just use a standard QWERTY layout than one of the variants. Of all these, the QWERTZ variant for German typists may be the most useful, since they have greater utilization of the letter Z than in English, and otherwise their QWERTZ layout bears great similarity to QWERTY.

QWERTY



QWERTZ

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AZERTY

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Part 3: Keyboard layout for Live Keys

See Live Key List for a tabular display of all Live Keys along with their Unicode values.

Special definitions for `~ accent/tilde key
Note that the Q Keyboard Spacebar only produces ordinary spaces

Keys pressed	Symbol	U+	Definition
CL `	***nbs***	**00A0**	**Non-breaking space** **Also on *Held AL / '* and Dead AA X space**
CU `	***nnbs***	**202F**	**Narrow non-breaking space** **Also on *Held AL / ;* and Dead AA M space**

Special definitions for – minus/underscore and = equal/plus keys

Keys pressed	Symbol	U+	Definition
CL –	·	**00B7**	**Middle dot**
CU –	−	**2212**	**Minus sign**
BL –	°	**00B0**	**Degree sign**
BU –	‐	**2011**	**Non-breaking hyphen**
AB –	-	**00AD**	**SHY - Soft hyphen; also on Dead AA – Spacebar**
BC –	•	**2022**	**Bullet**
AC –	–	**2013**	**En dash; also on *Held AL – N***
ABC –	⸗	**2E40**	**Double Hyphen**
AC =	—	**2014**	**Em dash; also on *Held AL – M***
ABC =	‗	**2017**	**Double Low Line**
BCU =	***id***	**-**	**A string identifying the keyboard variant such as QIK**

Note **color coding** of keys below:

- **Blue** is for **CC** symbols, where each left/right pair is **CL** (unshifted **CC**) then **CU** (shifted **CC**)
- **Green** is for **BB** symbols, where each left/right pair is **BL** (unshifted **BB**) then **BU** (shifted **BB**)
- **Red** is for **AA** symbols, where each left/right pair is **AL** (unshifted **AA**) then **AU** (shifted **AA**)

- **Red letters on Green background** are **AB** symbols, where **AA** and **BB** are held together
- **Blue letters on Green background** are **BC** symbols, where **BB** and **CC** are held together
- **Letters on Violet background** are **AC** symbols, where **AA** and **CC** are held together

- **Letters on Light Blue background** are Hyper Keys, where **Red is lower case** and **Blue is upper case**
- **ABC** = Hold **AA** + **BB** + **CC** together
- **BCU** = Hold **BB** + **CC** + **Shift** together (**U** is for Upper case shift)

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nbs	nnbs	¡	¹	¢	²	£	³	€	€	‰	%	¬	√	¥	∞	§	×	¶	·	ø	Ø	·		±	≡		
ə	Ə	ā	Ā	ɛ	Ɛ	ē	Ē	ʒ	Ʒ	ǯ	Ǯ	ȳ	Ȳ	ū	Ū	ī	Ī	ō	Ō	ǿ	Ǿ	°	-	≈	≠		Backspace
Dead key		Dead key		Dead key		Dead key		Dead key		Dead key		Dead key		Dead key		Dead key		Dead key		Dead key		Dead key		Dead key			
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CC Ctrl	BB Win		AA Alt																Alt		Win		App	Ctrl	

Dead Key notation and usage

1. Each Dead Key diacritic is noted by a heading of **Dead key**.

2. Dead Keys are activated by the use of the **AA** modifier, or **AA**+Shift for accented capital letters.

3. To produce an upper-case **Dead Key** accented letter, you may either hold the Shift key when **AA** is pressed, or the Shift can be held down afterwards when the base letter key is typed. This is known as choosing between **Early Shift** and **Late Shift**. The Help documentation explains this in more detail. The rules for ***Held Keys*** are different.

4. For *software-defined keyboards,* the **AA** modifier is a repurposed **Alt** key. The specific **Alt** key(s) available for use as **AA** modifier(s) depends on the keyboard layout version that is currently active. For hardware-defined keyboards*,* **AA** is a discrete, physical key. Currently supported layouts only have the AA, BB and CC modifiers on the left side.

5. Accented letters shown under the **Dead key** headings in the diagram above are the representative characters for that dead key.

6. Each dead key has two representative characters, one for **lower-case** and one for **upper-case**. For instance, the representative characters for diaeresis are **ẍ** and **Ẍ**.

7. The hex values shown underneath the representative characters are the Unicode values for those representative characters, shown for information purposes only. It is not necessary to know these Unicode hex values to use the dead key facility.

8. A representative character may appear as unwanted "Dead Key Junk" if you attempt to place an accent on a letter that has no corresponding predefined accent form in Unicode. For instance, there is no such Unicode letter as **Q** with grave accent. If you try to produce one with a dead key, you will get a "junk" result like **àq**.

9. Underneath the hex values are descriptions of each dead key.

10. The **primary purpose** of a dead key is shown in **red**. For instance, the primary purpose of the **=+** dead key is to produce letters with **Macron** above.

11. The **secondary purpose** of a dead key is shown in **violet**. For instance, the secondary purpose of the **=+** dead key is to produce letters with **Line Below**. When a dead key has a secondary purpose, it means that the dead key is "shared" between two types of accents, such as **Macron** and **Line Below**.

12. Generally, there will be a Combining Diacritic associated with a dead key that matches its primary purpose. You would use a Combining Diacritic for letters that have no precomposed Unicode definitions. The Combining Diacritic symbol is typed **after** a base letter, and is produced by holding the **AA** modifier key and then typing the dead key **twice**. This symbol is the *main combining diacritic.*

13. Many (but not all) dead keys also have an **alternate combining diacritic***,* produced by holding down the **AA** modifier and a Shift key at the same time, and then typing the dead key

twice. The alternate combining diacritics are often symbols "related" to the main symbol, but are generally of lesser importance. For instance, on the key for Acute Above accent, the alternative diacritic is the Acute Below, which is only needed occasionally.

14. When a dead key description contains wording in **green**, the **green** wording describes the alternate combining diacritic.

15. When a dead key description contains wording in **violet** but **not** in **green**, the **violet** wording describes **both** the secondary purpose of a dead key **and** the alternate combining diacritic.

16. In a few cases, some dead key usage is slightly different from these general rules. See the Help documentation for a complete description of each key.

17. **Pink** letters above hyper keys (like **Z̲**) show the accented letters produced by **Macron** dead key (key **0C**). This information is provided for comparison purposes. **Gray** letters above hyper keys (like **X**) show the letters that have no precomposed Macron or Line Below of their own. Hyper key letters will contain either a Macron above or Macron Below, depending which is most appropriate and readable. Consult the Hyper keys article for more information.

19. For **Dead Key** and ***Held Key*** letters, the **AA** modifier plays a role comparable to the **AltGr** key on other international keyboards.

20. ***Held Key*** letters utilize **AA** modifier plus optional Shift, with **AA key held down for the complete sequence**. Held-key usage of AA is emphasized in documentation by showing the key sequence with ***AA*** in ***red italics***.

21. Live Key letters in **blue background** require a hyper-shift of **ABC** or **BCU** to produce.

22. Greek Dead Key letters are only shown here for convenience. These require Dead Key AA 4 to produce. There are no Live Key letters for Greek, except for Greek-like math symbols on Live Key **M**.

23. **AA [W** on key 1A contains Convenience Keys **ŵ Ŵ** with Circumflex Above, and **AA] W** on key 1B contains supplemental **ẁ Ẁ** with Grave Accent; these are used in Welsh.

24. Unlike other international keyboards, the Q Keyboard Spacebar only produces ordinary spaces, regardless of any combination of Shift or AA, BB or CC modifiers being held down. See the Help documentation for specialized Unicode spaces and joining control characters.

25. On selected **Live Keys**:
- symbols shown in **white on a blue background** are **followed** by a non-breaking space
- symbols shown in **white on a red background** are **preceded** by a non-breaking space

26. For the Guillemet quotes **« ·** and **· »** on **AC <** and **AC >** these are followed and preceded by **Narrow Non-Breaking Spaces**, respectively.

27. The "base" state of a standard QWERTY key has no modifier key associated with it. However, use of a key in its unmodified state can be documented by the notation **LL**, just as upper case is shown by **UU**. For instance, lower case **A** could be called **LL A**, and upper case **A** could be called **UU A**. The **LL** and **UU** notations are a documentation shorthand, to clarify the

case of a letter when it is not involved with one of the **AA**, **BB** or **CC** modifiers.

28. To highlight whether or not modifier **AA**, **BB** or **CC** are being used with Shift, the second letter is sometimes replaced with **U** or **L**. For instance, **CU** means **upper-case** CC, when **CC** is used with Shift. **CL** is **lower-case** CC when **not** being used with Shift. These are simply documentation conventions, and do not change the meaning or use of these keys. See Understanding modifier key notation for more information.

Part 4: Additional features

In this section, a number of additional Q Keyboard features are discussed.

Much of this can be deduced from a close inspection of the Dead Key Guide, but these features are presented here by topic, so you don't have to read through every article in the Dead Key Guide to find the information you need.

African letters

The subject of African languages is vast. Reference sources do not even agree on how many African languages there are, with estimates ranging from 1,250 to 3,000. Recent figures from Ethnologue put the number of living languages in Africa at 2,143.

The wide variation in estimates seems to stem from whether a given language is counted as unique in its own right or is determined to be a dialect of another language. Such determinations can be influenced by politics, the availability of language experts and documentation, and other factors. The best we can say is that Africa is extraordinarily diverse linguistically.

Further information can be found at https://en.wikipedia.org/wiki/Languages_of_Africa.

Some of these languages are outside the scope of the Q Keyboard design, or do not use what we are calling "African letters", and thus are not part of this discussion. These include:

- Languages with non-Latin scripts, such as Arabic, N'Ko, Tifinagh, Ge'ez and others
- Languages that use only unaccented Latin letters A-Z
- Languages that came from outside, such as French, Spanish and Portuguese, which the Q Keyboard already fully supports with Live Keys. These includes languages derived from outside ones, such as Afrikaans, which originated from Dutch.

Over the years, many individuals and groups have worked to bring literacy to the African people, including religious and secular educators, scholars and government agencies. At times, these groups would work together, compare notes, and try to come up with unified strategies. As a result, there is a considerable degree of commonality in many of these languages and alphabets.

Here are some of the more well-known alphabet standards:

- Africa Alphabet
- African Reference Alphabet
- Berber Alphabet
- Dinka Alphabet
- General Alphabet of Cameroon Languages
- ISO 6438, now superseded by Unicode
- National Alphabet of Bénin
- Pan-Nigerian Alphabet

Latin-based African languages share a number of common characteristics, and the Q Keyboard supports each of these. Because there are so many languages involved, each with their own unique alphabets, you will need to familiarize yourself with the complete range of Q Keyboard capabilities when typing these African scripts.

In nearly all cases, you should find that the Q Keyboard provides what you need. However, because so many different African languages exist, it is not possible to guarantee that a particular one you might try to type will be fully supported. With user feedback, if any deficiencies are found these could be corrected, provided that there is space available to add new letters, and if this could be done in a manner consistent with the rest of the Q Keyboard's design.

Having said that, as part of the Q Keyboard development process, many African alphabets were very closely examined, and the current keyboard design has no known deficiencies at this time with respect to support for African letters. Besides checking specifically for African languages, a set of 750 Latin alphabets of all sorts, made available from Simon Ager and the Omniglot web site, were analyzed, and this confirmed that all of their letters were present on the Q Keyboard. Additionally, an exhaustive, painstaking comparison of the Q Keyboard's character repertoire against the complete list of all Unicode letters was performed, to confirm that no letters that were even of marginal usefulness were being overlooked.

The Q Keyboard is one of the few international keyboards that includes support for **Circumflex Below** letters, required for the African language **Venda**. These are available on the Dead Key **[** 1A.

The author would like to acknowledge the assistance of Denis Jacquerye, who graciously made available an informative document, "Characters needed for African orthographies in Latin writing systems", and in providing the link to a GitHub web site containing his comprehensive list of African letters. That GitHub link is located at https://github.com/moyogo/anloc-data.

The Q Keyboard contains all letters noted in the Jacquerye GitHub list.

The African letter list at "*Character Requirements for African (Latin) Orthographies*" http://scriptsource.org/cms/scripts/page.php?item_id=entry_detail&uid=hgn4alf2lf was also consulted for comparison purposes. The Q Keyboard contains all letters and control codes noted in the Script Source list for African languages.

See the article Bidirectional text for a discussion of this feature on the Q Keyboard. These control codes may be considered as "spacing symbols".

The following Unicode formatting characters noted in the Script Source list are available (these require use of Shift):

- ***Held AU / R*** **U+FFFD** Replacement Character
- ***Held AU / L*** **U+2028** Line Separator
- ***Held AU / P*** **U+2029** Paragraph Separator

The symbol **U+2027** Hyphenation Point in the Script Source list may be found on **Live**

Key CU 9.

In most cases, the Hyphenation Point and Middle Dot were found to have identical or nearly identical glyphs. Font availability for Hyphenation Point is limited. If it is absent from the font you are using, Middle Dot on **Live Key CL –** should serve well as a substitute.

In addition to being familiar with all of the Live Keys and Dead Keys for common accent types, you will find additional resources on these Dead Keys:

- Key 04 for Greek
- Key 05 for Descender letters
- Key 06 for Circumflex
- Key 07 for Hook and Retroflex Hook letters
- Key 09 for certain phonetic symbols
- Key 0A (**0**) for combining modifier letters and Palatal Hook letters
- Key 1A (**[**) for Circumflex Below
- Key 31 (**X**) for Extra symbols and special punctuation
- Key 36 (**M**) for Miscellaneous symbols

See also Phonetic symbols for a list of supported IPA symbols.

You should find that Dead Key **AA X** has many or most of the African letters you will need. **AA M** is also quite helpful. The others you will make occasional use of.

Here is a list of language features and issues you will encounter. These should be considered as guidelines to help you find the Q Keyboard characters you need.

1. When accents are needed, they use existing diacritic types found in European languages, including Acute, Grave, Circumflex, Circumflex Below, Caron, Macron, Tilde, Diaeresis, Dot Above, Dot Below, and Line Below, among others. There are no unusual or "African-specific" accents that don't exist elsewhere, though some letters may require the use of **combining modifiers**, discussed next.

2. Sometimes diacritics are combined to form letters that don't have precomposed Unicode symbols. In a few cases, this involves adding one diacritic to a plain letter, but often it means creating a dual-diacritic letter that is not a predefined one. For instance, **O** with Acute accent and Dot Below might be used. (Incidentally, this is not a Vietnamese letter.) Using the Q Keyboard's combining modifier feature, you could add an Acute accent to an **ọ** with Dot Below, or add a Dot Below accent to an **ó** with Acute, to get the same **ọ́** result. Be sure you understand how the Q Keyboard handles combining modifiers. The list of supported combining diacritics is very comprehensive. When a given accented letter can be created more than one way, as in the example of **ọ́** above, you may find that one may be more attractive than another, based on the font used. You will have to experiment to find which technique works best for you.

3. There is frequent use of the **Open E** letter **Ɛ ɛ** and the **Open O** letter **Ɔ ɔ** • Letter **ɛ Ɛ** is on **Live Key BB 2** and **Dead Key AA X E**. Letter **ɔ Ɔ** is on **BB V** and **Dead Key AA X O**. Be careful not to confuse the lower-case **ɛ Open E** with the lower-case **ε** Greek **Epsilon**, which looks nearly identical.

4. Sometimes the **ɛ Ɛ** Open E and **ɔ Ɔ** Open O will contain a Diaeresis or a Tilde. These are available as Hyper Keys. If you need these letters with any other kinds of accents, these must be applied manually with combining diacritic symbols. If using Hyper Keys takes more effort than you prefer, you can start with the unmodified **ɛ Ɛ** and **ɔ Ɔ** and then add the required accents. These letters do not always compose well, depending on the fonts and applications you use.

5. Many alphabets contain what is termed the "**African D**" which appears as **Ð ɖ** • The upper-case version of this letter is officially called U+0189 **Latin Capital Letter African D**, while the lower-case ɖ that is normally paired with it is not called "African", but simply U+0256 **Latin Small Letter D with Tail**. See https://en.wikipedia.org/wiki/African_D for more information.

Because the capital letter **Ð** looks the same as the unrelated **Ð ð** and the **Ð đ Live Key** letters, care is needed when typing them to be sure you use the right one. African languages may use either the African "Miscellaneous D" **ɖ Ð** on **AA M D** or the "Extra D" **đ Đ** with Hook on **AA X D**.

6. In a few African languages, you may run into a problem if both **ɖ** (small letter **D with tail**) and **ð** (small letter **Eth**) are used. Since both of their upper-case forms appear as **Ð**, there is no official way to distinguish them. There are some unofficial methods people have tried to draw a distinctive upper-case equivalent of letter **ð** Eth, but no Unicode definitions currently exist. In the author's view, these attempts look unusual and unattractive. It is possible to add a combining modifier to a form of **D**, but because **D** does not often take accents, combining modifiers generally don't render well. A better solution is needed.

Here is a suggestion you may wish to try. For either the letter **ɖ** or **ð** pick one of them and use its associated capital form of **Ð** as is. For the other letter, pick an existing precomposed capital **D** of another type. Here are some possibilities. The **Caron** or **Dot Above** substitutions are recommended as the most practical choices, since these avoid diacritics below the letter, which can sometimes be obscured when words are underlined. **D with Caron** has the convenience of being available as a **Live Key**. **D with Hook** could possibly be used, but since this letter is also present in many African alphabets, it may be confusing. There is no perfect solution to this. You just have to make the best choice you can.

Dead Key Live Key	Sym	U+	Description

AU] D AU D	Ď	010E	Latin Capital Letter D with Caron
AU . D	Ḋ	1E0A	Latin Capital Letter D with Dot Above
AU X D	Ɗ	018A	Latin Capital Letter D with Hook
AU \ D	Ḍ	1E0C	Latin Capital Letter D with Dot Below
AU = D	Ḏ	1E0E	Latin Capital Letter D with Line Below
AU , D	Ḑ	1E10	Latin Capital Letter D with Cedilla
AU [D	Ḓ	1E12	Latin Capital Letter D with Circumflex Below

Author's recommendation

Consider the shape of the **Small Letter Eth**, enlarged here to show detail: ð

On top, where the "crossbar" crosses the upper stem of the **d**-like shape, notice how it appears to create a shallow ˅ much like a **Caron** accent. This leads to the following recommendations:

- For **ð** (small letter Eth) on **Live Key BL D**, use **Ď with Caron** on **Live Key AU D** as the capital form. You can also type **Ď** as **Dead Key AU] D** if you wish.

- For **ɖ** on **Dead Key AL M D**, use its corresponding **Ð** on **Dead Key AU M D** as the capital form.

7. You will often observe use of the **Reversed E** as **Ǝ ə** • This is a variation on the letter **Schwa Ə ə** • Be aware that the lower-case letters here look identical but have different Unicode values. For languages that use **Ǝ U+018E Latin Capital Letter Reversed E**, available references cite **ǝ U+01DD Latin Small Letter Turned E** as the correct choice for lower-case, rather than the similar **ə** Schwa or the **ɘ U+0258 Latin Small Letter Reversed E** that *seems* like it should have been the right one.

> Because reference works are sometimes inaccurate, and language orthographies and prevailing practices can and do change at times, you should consult authoritative sources like native speakers to confirm current correct usage in the African language you are interested in.

The **Ǝ** Capital Reversed E letter and **ǝ** Small Letter Turned E are available on **AA M E** while **ə** Schwa is available as a **Live Key** on the **BB** ` (grave) accent key and on **Dead Key AA X X**. It turns out that **AA X X** for Schwa is actually quite easy to type, and you may prefer it over the Live Key version.

8. **H** with stroke **Ħ ħ** is sometimes used. This is the same accented **H** that appears in

Maltese. You can type this either as a **Live key** using **AB H** and **BC H** or as a Dead Key with **AA – H**

9. Variations of **ɪ** are used, such as **ɪ** with stroke **ɨ ɨ** which appears on **Dead AA – ɪ and on Live Key AB ` and BC ` •** There is also a **Latin Iota** letter **ι ι** on **AA X ɪ** which is used as an "alternative letter **ɪ**". If you need a **Latin Small Iota with Stroke**, it appears like **ɨ** and is on ***AL – ɪ*** • (Notice how this letter almost looks like a tiny lower case **t**.)

10. A few languages use **Small Capital ɪ** and also **Capital Letter Small Capital ɪ**. That second letter (with its rather confusing name) is new, and few fonts support it. One that does is Roman Cyrillic Std. You can type these using ***AL X ɪ*** and ***AU X ɪ***

11. Lower-case dotless **J** is sometimes used, both as **ȷ** and as **ɟ** with a Dash Stroke through it. You can produce **ɟ with Dash Stroke** as a ***Held Key*** using either ***AA – J*** or as ***AA . J*** and get the same results. Note that Lower-case dotless **J** appears in the special Dutch digraph for accented **IJ**.

12. You may see Ezh **ʒ ʒ**, and sometimes Reversed Ezh **Ɛ ɛ** • However, the **Ezh ǯ ǯ with Caron** is not frequently used. (Ezh **ǯ ǯ** with Caron appears in Scandinavian languages, such as dialects of **Sámi**.) Ezh **ʒ ʒ** is on **BB 4**, Ezh with Caron **ǯ ǯ** is on **BB 5** and Reversed Ezh **ɛ Ɛ** is on **AA X Z**

13. Various forms of **N** are used. These include **Ñ ñ** with Tilde, Eng **Ŋ ŋ**, and **ɲ Ɲ** with left hook, which are all available as **Live Keys**. A small number of languages use **n̈** with Diaeresis. There are no precomposed letters for **n̈** with Diaeresis. You can compose them manually, using **n/N** and ***AA : :*** for the combining diaeresis symbol, or you can use the Hyper Keys on **ABC :** and **BCU :** to have them composed for you.

There was an unusual type of letter **N** proposed for the African Reference Alphabet called a *Linearized Tilde*. Its appearance is like a capital **N** with the "corners" rounded, as if a Tilde accent **~** was vertically "stretched" so as to become a letter in its own right. This was never adopted into Unicode, so the Q Keyboard does not support it. Images of this letter can be found on Wikipedia.

Those wishing to convey the idea of a Linearized Tilde can use any of the available accented form of **N** on the Q Keyboard. Some possibilities include:

- U+014B/014A **ŋ Ŋ** Letter Eng on **BB B**
- U+0272/019D **ɲ Ɲ** Letter N with Left Hook on **AB B** / **BC B**
- U+019E/0220 **ƞ Ƞ** Letter N with Long Right Leg on **AA M N**
- U+A7A5/A7A4 **ꞥ Ꞥ** Letter N with Oblique Stroke on **AA / N**

For a distinctive solution, you could try typing a plain **n N** first, then adding a **Combining Tilde Below** afterwards with ***AL 2 2*** to create **n̰ N̰** which might serve as a good representation of this letter. If you do this, remember to type **n** or **N**, then ***hold AA*** and type the **2** key **twice** without using Shift.

14. **Barred O** and **O with middle Tilde** as **Ɵ ɵ** can be typed as **Live Key AB 0** and **BC 0** (zero), as Dead Key **AA – O** or as Dead Key **AA 2 O**

15. **Turned V** as **Λ ʌ** is occasionally used. You can type this as a "Miscellaneous V" using **AA M V**

16. **R with stroke/crossbar** is sometimes used: **Ꞧ ꞧ** is on Dead Key **AA – R**

17. **R with tail** is sometimes used: **Ʀ ɾ** is on Dead Key **AA X R**

18. Many "hooked" letters can be found as Dead Keys on **AA X**, some on **AA 5** and some on **AA M**. Prominent among these are **Hooked B** and **Hooked D**, as **Ɓ ɓ** and **Ɗ ɗ** • Some languages have the same sounds these represent, but use a leading apostrophe with plain letters instead, as **'B 'b** and **'D 'd**. You will find letters with the Vietnamese "hook above" and some with retroflex hooks on **AA 7**

The Q Keyboard has two hooked letters available as **Live Keys**:

- **Hooked ɓ Ɓ** is on **AB ;** and **BC ;** (semicolon) respectively
- **Hooked ɗ Ɗ** is on **AB '** and **BC '** (apostrophe) respectively

19. Some languages use Modifier Letters like **w** or **o**, as in **Qʷ** and **Qᵒ** • These are on ***AA M*** as ***Held Keys***. Most (but not all) of these letters have both lower-case and upper-case forms, so you would use either ***AL M*** or ***AU M*** as needed. A small number may also use Combining Modifier Letters, which are on ***AU 0*** (zero). Remember that ***AU*** means to use **AA+**Shift. You might be able to substitute a **° Degree** symbol as found on **BL –** or possibly the **Masculine Ordinal** symbol º on **AC O** for a **Modifier Letter O**.

20. Glottal stop and click symbols and Modifier Colons **ʔ ʕ ʘ ǃ ǂ ǀ ǁ ː ˑ** are sometimes used, which can be found on **AA 9** and **AA X** with a few on Live Keys. Glottal stop symbols are arranged so that the "standard" forms are **Dead Keys**, while ones containing a Dash Stroke are typed as ***Held Keys***. The dashed variants are used infrequently. Many of the glottal stop and click symbols in the article noted above are present in African languages, except for the **Saltillo** mark which is mostly used in Mexico. The most commonly used of these is **ʔ U+0294 Latin Letter Glottal Stop**, which can be found on **Live Key BL /**

21. There are languages that incorporate Greek letters, like Alpha, Gamma, Iota, Lambda, Sigma, Theta, Upsilon, and Omega. Sometimes these will be Latinized versions of Greek letters. In others cases, you will have to actually type Greek letters. These can be found on **AA 4**

See Understanding modifier key notation for an explanation of modifier codes.

Apothecary symbols

The Q Keyboard contains a number of **Apothecary symbols**. The one in current use that people are familiar with is the ℞ prescription symbol. This is available on **Dead Key AA M R**, where the same symbol is present for both upper and lower case.

Other apothecary symbols have been in use for centuries, in one form or another, but are generally considered archaic and deprecated. Those symbols were old units of measure, which have been replaced by the metric system, and are now mostly of historical interest.

A helpful web site that explains most of these symbols can be found here: http://www.textcreationpartnership.org/docs/dox/medical.html

Because these symbols are old and greatly predate the printing press (and modern concepts of standardization), there is considerable variability in their shapes as well as in the precise meaning of each symbol, which differed from one region to the next. Apothecary workers understood the symbols themselves, but disagreed over the exact volumes or weights they represented. In the age of printing presses, some apothecary formulas used incorrect symbols when printers ran out of one type and substituted another. Other symbols were used for more than one purpose, creating ambiguity and confusion.

Many variations of the letter **Ezh** were used for the unit of measure called a **Dram**, **Drachm** or **Drachma**. The representation that seems to have been used most is a plain **ʒ Ezh**.

The **Minim** notation borrowed available astrology symbols, since they resembled the letter **M**. Evidently, the symbol ♏ based on the **Scorpius** sign was preferred over the symbol ♍ based on the **Virgo** sign. In modern terms, a **Minim** was a small quantity, holding **1/480** of a fluid ounce. More information about the **Minim** can be found at https://en.wikipedia.org/wiki/Minim_(unit).

Another small quantity was the **Grain**, abbreviated in ordinary letters as **gr**.

When a measurement needed to include a **half** unit, such as two and a **half** ounces, the expression for "half" was the Latin term "**semis**". This got abbreviated to **SS**. Various forms of **SS** were used, such as the **Eszett** letter **ß** or **ß** present in German, or a combination of the **Long S** letter **ſ** followed by a regular **s** to make an **ſs** digraph. Some instances of **SS** in old documents look like unreadable scribbles, and it is hard to recommend a suitable symbol. If you were transcribing such a document, you would have to understand what you were reading, and then pick something appropriate.

A symbol involving a stylized letter **Q** with a mark above was used for "quart", "quarter", "quarterne", "quam" or "farthing", where "farthing" is related to the word "forth". An

exact representation is not possible, but the **QP** digraph **ꝓ** with a Macron or Tilde added might approximate it. You could also try a lower-case **ꝓ with Slash Stroke** on **AL / Q** • Since these involve combining modifiers, your results will depend on the font used, and may or may not work well. See Combining Diacritics Dead Key List for information about adding accents. The digraph **ꝓ** on ***AL 8 P*** by itself may be close enough for your purposes without adding a Macron or Tilde.

The Cyrillic letter **э Э** on **AA W 2** could be used as a substitute for the **Scruple** symbol ℈ on **AL M 2**. However, availability of the **Scruple** symbol is good in most fonts, so a substitution will usually not be necessary.

The supported symbols are enough to represent most apothecary measurements, but because so much historic practice reflected regional variations and creative, archaic handwriting, not all of it can be literally reproduced with a keyboard.

As with all specialty symbols that are not frequently used, be sure to test the characters you use in your documents to confirm the fonts and applications are working correctly.

Key	Sym	U+	Description
Dead AL M R	℞	**211E**	Prescription Take
Dead AU M R	℞	**211E**	Prescription Take
Dead AL M 2	℈	**2108**	Scruple
Dead AL W 2	э	**044D**	Cyrillic e; substitute Scruple
Dead AU W 2	Э	**042D**	Cyrillic E; substitute Scruple
Dead AL M 3	℥	**2125**	Ounce sign
Dead AL M 4	♏	**264F**	Minim; Scorpius
Dead AL M 5	♍	**264D**	Minim; Virgo
Dead AL M 6	℔	**2114**	Pound; L B Bar sign
Dead AL M Z	ʒ	**01BA**	Dram; Ezh with Tail
Held AL 8 E	ʓ	**0293**	Dram; Ezh with Curl
Live BL 4	ʒ	**0292**	Dram; Small Ezh
Live BU 4	Ʒ	**01B7**	Dram; Capital Ezh
Live AC S	ſ	**017F**	Long S
Live AB S	ß	**00DF**	Small Eszett
Live BC S	ẞ	**1E9E**	Capital Eszett

Held AL 8 P	ꝗ	**0239**	QP digraph
Dead AL / Q	ꝗ	**A759**	Small Q with Slash Stroke

A note about the ℞ symbol

It may seem unusual that the symbol for "**Prescription**" is ℞ when this clearly resembles the letter **R** and not **P**. The reason for this is that the original meaning of ℞ was "**Recipe**". The link between ℞ and Recipe is not just in English. Its translation in nearly every language in Europe is a form of either "Recipe" or "Receipt"; few of those translations start with a letter besides **R**. The symbol ℞ is clearly intended to be a reminder of the word Recipe.

In the past, nearly all medications given to patients were custom-blended from a recipe of ingredients, as if preparing a meal. Today, with mass-produced pharmaceuticals, custom-blending of medications is done only occasionally, in facilities called *compounding pharmacies*.

The main use of ℞ today is not to describe the *recipe* of a medication, but to provide authorization and directions for *taking* it. So, the Unicode name for ℞ is not just "Prescription" but "Prescription *Take*".

Archaic and lesser-used letters

The Q Keyboard supports a number of archaic and lesser-used letters still seen in some modern languages.

The distinction between "archaic" and "lesser-used" is often a matter of perspective. For instance, in Icelandic, the letter **þ Þ Thorn** is in common use, even though it's derived from Old Norse and the ancient Runic alphabet. To Icelandic speakers, this is just another letter, but others would probably view it as archaic.

Simply being "old" does not make a letter archaic, since the Latin alphabet itself is some 2,500 years old. A letter may be considered archaic if it is both old and has been abandoned from everyday use for an extended period of time.

> The **Thorn** in Icelandic originated from the version of the Runic alphabet called the "Elder Futhark" which first saw use in the second century AD. From that standpoint, the so-called "archaic" letter Thorn is actually **newer** than the Latin alphabet itself, which appeared much earlier, as its primitive origins go back even further than 2,500 years, dating to the 7th century BC.
>
> In contrast, the Rune symbols and the Runic alphabet really **are** archaic. No one uses Runes any more, except for fun or curiosity, or for historical research.

Among the lesser-used characters supported are "Insular" letters. These constitute a set of decorative letters invented in Medieval Ireland and used for a time in Europe. Many Insular letters were quite ornate and stylized for their time, and may be hard to recognize if you are not familiar with them.

For instance, the **Insular S** letter ꞅ doesn't look like an **S** at all, but almost like a long, lower-case **R**, and in fact closely resembles ꞇ which is "U+027C Latin Small Letter R With Long Leg". In reviewing a number of fonts where both of these characters were defined, they all looked identical - which is a confusing state of affairs.

It might make more sense if this were compared to the "Long S" letter ſ sometimes used in German. Not all Insular letters have been adopted into Unicode, but those that have been are supported. For more information on this topic, and to see a comparative progression in the styles of letters over the centuries, see the following:

https://en.wikipedia.org/wiki/Insular_script
https://upload.wikimedia.org/wikipedia/commons/c/c0/Evolution_of_minuscule.svg

The Q Keyboard supports many archaic and lesser-used letters, but not all of them, because of limited demand for these symbols.

Some lesser-used letters initially intended for linguists are not even used by **them** (or, not

used any more). This includes phonetic symbols that have been obsoleted by newer ones, some known to be mistakes or misprints, and some that were created before it was determined that the sounds they were intending to describe were unpronounceable. There are also Medieval letters that are used to transcribe historical documents in archaic versions of modern languages.

> That includes what are called "epigraphic" letters, which are found engraved on ancient buildings, grave sites and other physical objects of archaeological interest, but not found as often in conventional documents. Epigraphic letters can appear peculiar, such as an "Epigraphic Sideways I" and an "Epigraphic Archaic M". Epigraphic letters are not supported.

While the research performed by language experts is beneficial and provides valuable insights into ancient works, the specialized letters they use are generally not what writers of modern languages really need to compose documents for the 21st century.

The deciding factors for including a letter or not are whether writing samples can be found showing it to be still in current use and if there is an active interest in it, in languages having sufficient users to justify it being part of the keyboard. We also have to take into account whether a given letter can be "categorized" in a way that fits within the existing design. For instance, the letter Ꝿ with Slash Stroke is a seldom-used letter, but is one that is supported. That is because the Q Keyboard has an existing Slash Stroke Dead Key on the **/** key, and the letter **V** for that Dead Key was available. That gives us an easy way to *categorize* it - to find a reasonable place to put letter Ꝿ. In contrast, the **Broken L** letter ꞁ does not fit into any existing Dead Key usage, and is thus harder to categorize. Its distinctive feature is not an accent but a unique design and style, so it doesn't seem to "belong" to any of the existing Dead Keys. (It ended up as **AA 8 ;** which is not the most intuitive.) There are also cases where letters are so strange that it seems like few people would ever use them. "Strange" letters have to be both peculiar-looking and ones for which no writing samples could be found during the research phase.

These decisions, such as labeling some letters as "strange", are admittedly subjective judgment calls. Over time, it is possible that the list of available lesser-used letters might have to be adjusted. The fact that these letters **are** lesser-used means they are of lower priority, and thus expendable. Because there is limited documentation for these lesser-used letters, a currently supported letter might prove to be unnecessary, while an omitted one may turn out to be more important than first thought. Feedback is invited from users having expertise and insights into these issues.

> Users of the Q Keyboard who find someday that a lesser-used symbol has been removed with a new release of the software can either continue to use the older version, or enter their symbols using a Character Map or Alt X key sequence in a word processor, or with some similar technique, just as they would do now for any specialty symbols not on the current version of the keyboard (such as the many hundreds of arrows and math symbols).

New versions of the keyboard are expected to be stable, and will not remove previously existing character definitions unless there is a good reason for it. And, before any character is completely eliminated from the keyboard, characters with redundant definitions would be targeted first, so that a given letter that previously had two ways of typing it might then only have one way, but at least would still be available.

Since the keyboard already has a very extensive set of characters, there should not be a great need to add many more of them. Future changes are expected to be limited to minor corrections and additions of a few characters that might have been overlooked or that were requested by users.

An archaic letter currently under consideration is **Latin Letter Thorn with Diagonal Stroke**. It is being proposed to represent archaic scripts in Old English and Middle English. This letter has not yet received final approval by the Unicode Consortium. The proposed code points are **U+A7C0** for **Latin Capital Letter Thorn With Diagonal Stroke** and **U+A7C1** for **Latin Small Letter Thorn With Diagonal Stroke**. A discussion of this letter can be found on the Unicode Consortium web site at http://www.unicode.org/alloc/Pipeline.html.

Even though this has not yet been officially approved, it is reasonable to expect that it will be. Assuming that approval will take place, this letter will be assigned to **AA / P** so that the keyboard will be ready once it is approved. You can use the letter now and the correct Unicode values will be produced, but it would not appear until fonts are updated. Since the letter is pending approval, inclusion in popular fonts may take a while. Should the letter be denied approved or if its code points are changed, it would require a revision to the Q Keyboard software. This letter is marked as pending below.

Notes:

- **Key 08 (*) has a number of archaic letters, many of which (but not all) are noted below**
- Key 05 (%) contains letters with descenders as well as Ogonek letters
- Key 06 (^) contains extra Cyrillic letters as well as letters with Circumflex
- Key 07 (&) contains letters with Retroflex Hooks, Hook Above, Flourishes and Tails
- Key 0A (0) contains letters with Palatal and Retroflex Hooks, and selected Turned letters
- Key 0B (–) used mainly for letters with Dash Stroke, has several additional unique letters
- Key 11 (W) contains most Cyrillic letters
- Key 31 (X) defines Extra letters, including many used in African languages
- Key 36 (M) defines Miscellaneous letters

Some letters on the keys listed above may be considered archaic or lesser-used. The more notable of these appear below. **Not every single character on every dead key is exhaustively listed**. For instance, dead key **07** is used for "hook" symbols, such as Latin Small Letter **ş** with Hook. Since hooked letters are a primary purpose for key 07, they are all not repeated here. Rather than detailing every possible letter in the tables below, consult the appropriate **Dead Key guides** for more information, especially for **AA X** and

AA M.

Key 8 contains most archaic letters. If you don't see a letter you are looking for here, check Dead Key 08 for more information.

In addition to the other letters below, the Q Keyboard supports the dual diacritic letters of **Livonian**, an essentially extinct language related to Estonian and Latvian. It reportedly has no native speakers still alive, though some are trying to revive the language. Information on Livonian can be found on Omniglot and Wikipedia.

Some dual diacritic letters are also used in Pinyin script.

Livonian letters produced as **Held Keys**

Held Key	Sym	U+	Key	Sym	U+	Description
AL : A	ǟ	01DF	*AU : A*	Ǟ	01DE	A with diaeresis and macron
AL : O	ȫ	022B	*AU : O*	Ȫ	022A	O with diaeresis and macron
AL . O	ȱ	0231	*AU . O*	Ȱ	0230	O with dot above and macron
AL 1 O	ȭ	022D	*AU 1 O*	Ȭ	022C	O with tilde above and macron
AL . A	ǡ	01E1	*AU . A*	Ǡ	01E0	A with dot above and macron *

* **Ǡ ǡ** with Dot Above and Macron is not a Livonian letter, but it exhibits the "Livonian style". This letter is also reportedly in current use by some African languages (though it was not determined which ones those were), so it may not strictly be "archaic".

Archaic and infrequently used letters produced as **Live Keys**

Live Key	Sym	u+	Live Key	Sym	U+	Description
BL `	ə	0259	BU `	Ə	018F	Schwa
BL 2	ɛ	025B	BU 2	Ɛ	0190	Open E
BL 4	ʒ	0292	BU 4	Ʒ	01B7	Ezh
BL 5	ǯ	01EF	BU 5	Ǯ	01EE	Ezh with Caron
AB P	þ	00FE	BC P	Þ	00DE	Thorn §
BL D	ð	00F0	BU D	Ð	00D0	Eth ‡
AC K	ĸ	0138	K + AC [	K‘	-	Kra *
			AC J	J̌	-	Capital J with Caron †
CL X	ɣ	0263	CU X	Ɣ	0194	Latin Gamma
AB X	ẋ	1E8B	BC X	Ẋ	1E8A	X with Dot Above
BL V	ɔ	0254	BU V	Ɔ	0186	Open O
BL B	ŋ	014B	BU B	Ŋ	014A	Eng

AB B	ɲ	0272	BC B	Ɲ	019D	N with Left Hook

§ It is recognized that letter **Thorn** may be seen as more appropriately associated with key **T** on the keyboard, since Thorn was likely pronounced similar to the English digraph **TH**. However, key **T** is committed to other purposes. Because the appearance of Thorn resembles a lower case **b** merged with a lower-case **p** and key **P** was available, the use of key **P** seemed appropriate. On other keyboards, Thorn can be found on **B**, **P** and **T** and on its own key for Icelandic.

It is understood that some may be disappointed that Thorn doesn't have a more prominent place on this keyboard. Even though it is a **Live Key**, it takes two modifiers to type, even for lower case - thus requiring a little more keying effort. As with other aspects of the Q Keyboard, it is necessary to provide the most benefit to the most people. Available reference works state that the only modern language making use of Thorn is Icelandic, with just 350,000 speakers. Given the many priorities that have to be managed, the design is constrained as to what letters can have greater prominence. As with the rest of the keyboard, it is a judgment call by the author.

* **Capital Kra** must be composed manually, using Latin capital **K** and a Modifier Letter Turned Comma. Use of **Kra** in Greenlandic is deprecated. See Polynesian languages for a discussion of the keys available to produce Modifier Letter Turned Comma.

† **Capital J with Caron** is a Live Key digraph, as there is no such precomposed Unicode letter, and the keyboard cannot place digraphs on Dead Keys or Held Keys for technical reasons. Adding a Caron combining accent to a Capital Letter **J** may or may not compose in an attractive way, depending on the font used. You should test this to see if its appearance is acceptable in your environment.

‡ **Capital Eth Ð** on **BU D** should not be confused with **Capital Đ with Dash Stroke** on **CU D**. While letter **Eth Ð ð** may be viewed by some as "archaic", **Đ đ with Dash Stroke** is not.

Archaic and infrequently used letters produced as **Hyper Keys**

Key	Sym	Key	Sym	Description *
ABC `	ɛ̃	BCU `	Ɛ	Open E with Tilde
ABC 1	ɔ̃	BCU 1	Ɔ	Open O with Tilde
ABC 9	ɛ̈	BCU 9	Ɛ	Open E with Diaeresis
ABC 0	ɔ̈	BCU 0	Ɔ	Open O with Diaeresis
ABC :	n̈	BCU 0	N	N with Diaeresis

* All of these letters are composed digraphs, so U+ is omitted here.

Selected archaic and infrequently used letters produced as **Dead Keys** and ***Held Keys***

Note: Depending on the version of Windows you use to display this Help, symbols marked in **black with yellow background** and having descriptions marked with **‡‡ may be unavailable** and will display as empty-box substitute symbols. Even if a symbol cannot be displayed in **Help**, it should still work elsewhere (such as Microsoft Word) if present in the font being used. (This issue seems to have been resolved as of Windows version 10.)

Dead Key or *Held Key*	Sym	u+	Dead Key or *Held Key*	Sym	U+	Description
AL ` R	ɹ	027B				Small Letter Turned R with Hook
AL ` G	ɤ	0264				Small Letter Rams Horn ("Baby Gamma")
AL 1 B	ƃ	0183	AU 1 B	Ƃ	0182	B with Topbar
AL 1 D	ƌ	0183	AU 1 D	Ƌ	0182	D with Topbar
AL 1 R	ɾ	027C				Small Letter R with Long Leg
AL 1 R	ɿ	027A				Small Letter Turned R with Long Leg
AL 2 O	ɵ	0275	AU 2 O	Ɵ	019F	Barred o; O with Middle Tilde
AL 2 E	ɘ	0258				Small Letter Reversed E
AL 2 L	ⱷ	AB38				Small Letter L with Double Middle Tilde ‡‡
AL 3 L	ⱡ	2C61	AU 3 L	Ⱡ	2C60	L with Double Bar
AL 3 3	ɜ	2C7B				Small Capital Turned E
AL 3 G	ᵹ	1D77				Small Letter Turned G
AL 3 H	ɧ	0267				Small Letter Heng with Hook
AL 3 B	ɞ	025E				Small Letter Closed Reversed Open E
AL 3 M	ɯ	0270				Small Letter Turned M with Long Leg
AL 3 R	Ʀ	01A6				Latin (capital) letter YR **
AL 3 B	ɐ	029A				Small Letter Closed Open E
AL 4 9	ϱ	018D				Small Letter Turned Delta
AL 4 8	ɸ	2C77				Small Letter Tailless Phi
AL 4 Q	ϑ	03D1				Small Letter Theta Symbol
AU 4 Q	Θ	03F4				Capital Letter Theta Symbol
AL 4 D	δ	1E9F				Latin Delta
AL 4 L	ƛ	019B				Latin Lambda with Stroke
AL 4 B	ϐ	03D0				Beta Symbol
AL 4 R	ϱ	03F1				Rho Symbol
AL 4 W	ɷ	0277				Small Letter Closed Omega

AL 4 T	ꝑ	03FC				Small Letter Greek Rho with Stroke
AL 5 T	ꜩ	A729	AU 5 T	Ꜩ	A728	Latin Letter TZ
AL 5 S	ʅ	0285				Small Letter Squat Reversed Esh
AL 5 U	ᵾ	AB52				Small Letter U with Left Hook ‡‡
AL 6 R	ʁ	1D19				Small Capital Reversed R
AL 7 4	ɥ	02AE				Small Turned H with Fishhook
AL 7 4	ʮ	02AF				Small Turned H with Fishhook and Tail
AL 7 7	⁊	204A				Tironian Et
AL 7 R	ɾ	027E				Small Letter R with Fishhook
AL 7 R	ɿ	027F				Small Letter Reversed R with Fishhook
AL 7 P	ꝓ	A753	AU 7 P	Ꝓ	A752	Letter P with Flourish
AL 7 P	ꝗ	A755	*AU 7 P*	Ꝗ	A754	Letter P with Squirrel Tail
AL 7 F	ꞇ	AB34				Small Letter E with Flourish ‡‡
AL 7 B	ꞗ	A797	AU 7 B	Ꞗ	A796	Letter B with Flourish
AL 8 `	ɚ	025A				Small Letter Schwa with Hook
AL 8 `	ɝ	025D				Small Letter Reversed Open E with Hook
AL 8 2	ꞃ	A75B	AU 8 2	Ꞃ	A75A	Letter R Rotunda
AL 8 3	ȝ	021D	AU 8 3	Ȝ	021C	Yogh
AL 8 3	ʒ	A76B	*AU 8 3*	Ʒ	A76A	Latin Letter Et
AL 8 4	ɥ	A72D	AU 8 4	Ꞅ	A72C	Cuatrillo
AL 8 4	ꞅ	A72F	*AU 8 4*	Ꞅ	A72E	Cuatrillo with Comma
AL 8 6	ꞁ	1EFD	AU 8 6	Ꞁ	1EFC	Middle-Welsh V
AL 8 9	ꝯ	A76F	AU 8 9	Ꝯ	A76E	Latin Letter Con
AL 8 0	ꝏ	A74F	AU 8 0	Ꝏ	A74E	Letter OO
AL 8 B	ꝺ	0238				Small Letter DB Ligature
AL 8 D	ꝺ	A77A	AU 8 D	Ꝺ	A779	Insular D
AL 8 E	ɛ	A72B	AU 8 E	Ɛ	A72A	Latin Letter Tresillo
AL 8 E	ʒ	0293				Small Letter Esh with Curl
AL 8 F	ꞙ	A77C	AU 8 F	Ꞙ	A77B	Insular F
AL 8 G	ꞡ	1D79	AU 8 G	Ꞡ	A77D	Insular G
AL 8 G	ꞡ	A77F	*AU 8 G*	Ꞡ	A77E	Turned Insular G
AL 8 H	ꞕ	2C76	AU 8 H	ꞕ	2C75	Latin Letter Half H
AL 8 L	ꝇ	1EFB	AU 8 L	Ꝇ	1EFA	Middle-Welsh LL
AL 8 ;	ꞎ	0234				Small Letter L with Curl
AL 8 O	ꝋ	2C7A				Small Letter O with Small Ring Inside
AL 8 O	ꝋ	A74D	AU 8 O	Ꝋ	A74C	Letter O with Loop
AL 8 P	ꝑ	01BF	AU 8 P	Ꝑ	01F7	Letter Wynn
AL 8 P	ꝓ	0239				Small Letter QP Ligature
AL 8 R	ꞃ	A783	AU 8 R	Ꞃ	A782	Insular R - glyph resembles Latin "n"

AL 8 R	ʁ	AB49				Small Letter R with Crossed Tail ‡‡
AL 8 T	ꞇ	A787	AU 8 T	Ꞇ	A786	Insular T
AL 8 S	ꞅ	A785	AU 8 S	Ꞅ	A784	Insular S - glyph resembles Latin "r"
AL 8 V	ꝟ	A769	AU 8 V	Ꝟ	A768	Latin Letter Vend
AL 8 W	ꝡ	A761	*AU 8 W*	Ꝡ	A760	Letter VY
AL 8 ;	ꞁ	A747	AU 8 ;	Ꞁ	A746	Broken L
AL 8 J	ɮ	026E				Small Letter Lezh
AL 0 W	ʍ	028D				Turned W
AL 0 R	ɹ	0279	AU 0 R	ʀ	1D1A	Turned R, Small Capital Turned R
AL 0 T	ʇ	0287	AU 0 T	Ʇ	A7B1	Turned T
AL 0 Y	ʎ	028E				Turned Y
AL 0 U	ɷ	AB63				Small letter UO ‡‡
AL 0 I	ɜ	AB61				Small letter Iotified E ‡‡
AL 0 Z	ɮ	01AA				Reversed Esh Loop
AL 0 K	ʞ	029E	AU 0 K	Ʞ	A7B0	Turned K
AL 0 L	˥	A781	AU 0 L	˥	A780	Turned L
AL – E	ɘ	2C78				Small Letter E with Notch
AL – R	ɾ	2C79				Small Letter Turned R with Tail
AL = Q	ǽ	1EFB	AU = Q	Ǽ	1EFA	AE with Macron
AL = P	ꝥ	A765	AU = P	Ꝥ	A764	Thorn with Stroke
AL = P	ꝧ	A767	*AU = P*	Ꝧ	A766	Thorn with Stroke through Descender
AL / P	ꝩ	A7C1	AU / P	Ꝩ	A7C0	Thorn with Diagonal Stroke - pending
AL , N	ʼn	0149				Small Letter N preceded by Apostrophe §
AL ' N	ʼn	0149				Small Letter N preceded by Apostrophe

§ Unicode describes **Small Letter N preceded by Apostrophe** by stating, "this character is deprecated and its use is strongly discouraged". However, users needing to edit older documents or to describe the old orthography, as well as speakers of Afrikaans wishing to retain their typing habits, may still have need for this. The Q Keyboard supports Letter ʼn Preceded by Apostrophe, even though it is deprecated in Unicode, for sake of completeness and because it remains present in the Windows WGL4 character list.

** The Old Norse **Latin Letter YR** at U+01A6 is not labeled as "Capital" in the Unicode standard, but is in fact considered a capital letter. There is no official lower-case **YR** form, but the **Small Capital R** letter ʀ on ***AL X R*** is generally used for that purpose.

See Understanding modifier key notation for an explanation of modifier codes.

Arrows

The Unicode standard defines a vast array of arrows and arrow-like symbols. A check of all Unicode characters containing a name that included **Arrow**, **Arrowhead**, **Harpoon** or **Pointer** found over **500** entries. (A "harpoon" is an arrow-like symbol such as ↽ that has a one-sided arrowhead.) Most fonts contain only a small subset of these arrows, and the Q Keyboard has a limited capacity to represent them all. So, in providing support for arrows, consideration was given as to which ones would likely be available, and of those, which would be the most useful. In addition, a survey was made of every available international keyboard that has features comparable to the Q Keyboard, and every arrow form found on every such layout is included in our design.

Some of these symbols are not really "arrows" but do have "pointed" or "directional" shapes, such as the ∩ intersection symbol. These are included here so you can see them all in one place. They might give you creative ideas about which symbols would work best for a particular use.

See also Notable symbols and punctuation, item 28 for arrow-like caret symbols.

Notes:

- The Northeast ↗ and Southwest ↙ arrows on **AB /** and **BC /** follow the same "slant" as the **/** character. The West ← and East → arrows on **AB <** and **AB >** follow the same direction as the **<** and **>** symbols. This may help in remembering them.

- When a key is shown like **AB >** the Shift key is not used, even though an ordinary **>** symbol would have required a Shift to produce. The **>** symbol is shown in the table only for documentation purposes, to highlight the direction of the arrow. **Do not use Shift**.

- To relate the **<** and **>** keys with the orientation of arrow symbols, review the Quarter Turn Clockwise Rule for more information.

- The Unicode Standard uses different descriptions for some of these arrows. The "map" terminology shown here is used to provide a consistent way of describing them.

- The symbol ↨ U+21A8 **Up Down Arrow with Base** on **Dead AL – /** is of limited usefulness and is not well-defined. It is present here primarily because it is part of the Windows **WGL4** standard.

The Q Keyboard has **Live Key** support for the following arrow symbols, in the **U+2190** to **U+2199** block of Unicode.

Arrow symbol Live Key Guide

Live Key	Symbol	Description
AB M	↖	Northwest
BC M	↘	Southeast
AB <	←	West
AB >	→	East
BC <	↑	North
BC >	↓	South
AB /	↗	Northeast
BC /	↙	Southwest
ABC <	⋘	Very Much Less Than
ABC >	⋙	Very Much Greater Than

Arrow symbol Dead Key Guide

The following table shows every Arrow and arrow-like symbol available as **Dead Keys** and ***Held Keys***. This make it convenient to find these symbols all in one place instead of having to search the entire Dead Key Guide to locate them. You may wish to refer to the Math guide for "pointed" symbols that may not strictly be "arrows", such as the ∢ symbol. Arrows are not considered Math symbols.

Other characters on the same keys that are not arrows are grayed-out or omitted.

This list includes certain arrow-like combining modifier accents on Dead Key 08, which could possibly be used to signify a math ***vector***. These include:

- 20D0 Combining Left Harpoon Above
- 20D1 Combining Right Harpoon Above
- 20D6 Combining Left Arrow Above
- 20D7 Combining Right Arrow Above

Font support is poor for these arrow/harpoon symbols. Most fonts don't have them, and those that do often do not combine them properly. In testing, only Dejavu Sans, Symbola and Roman Cyrillic Std were found to work correctly. The examples in this documentation use Roman Cyrillic Std to display them, as it does the best rendering.

The arrows below on key 6 are not combining, but are Phonetic symbols.

QWERTY Keys		AA Dead Key Symbols				*AA Held Key Symbols*			
LC key	UC key	AL u+	AL sym	AU U+	AU SYM	AL u+	AL sym	AU U+	AU SYM
Dead Key 00 ` ~									
4	$	221C	∜			22BB	⊻		
5	%	22BC	⊼			22BD	⊽		
6	^	2227	∧			2228	∨		
7	&	2229	∩			222A	∪		
,	<	27E8	⟨			27EA	⟪		
.	>	27E9	⟩			27EB	⟫		
Dead Key 01 1 !									
,	<	21BD		21BC		21BF		21BE	
.	>	21C0		21C1		21C2		21C3	
Dead Key 02 2 @									
,	<	25C2	◂			25B4	▲		
.	>	25B8	▸			25BE	▼		
Dead Key 03 3 #									
,	<	2329	〈			226A	≪	22D8	⋘
.	>	232A	〉			226B	≫	22D9	⋙
Dead Key 04 4 $									
,	<	22B2	◁			2206	Δ		
.	>	22B3	▷			2207	∇		
Dead Key 06 6 ^									
,	<	2E34	‚			A71B	↑		
.	>	2E33	.			A71C	↓		
Dead Key 08 8 *									
,	<	20D0	↼			20D6	↽		

.	>	20D1	ȏ			20D7	ȏ		
/	?	034E	ọ			20E1	ȏ		
Dead Key 0A 0)									
,	<	2221				2222			
.	>	2220				2299		229A	
/	?	21AF				2298			
Dead Key 0B – _									
3	#	21B0				02E7	fi		
4	$	21B1				02E8	fl		
5	%	21B2				02E9	β		
6	^	21B3							
7	&	21B4							
8	*	21B5							
,	<	21A4				21A5		21B6	
.	>	21A6				21A7		21B7	
/	?	21A8				1DC4	◌		
Dead Key 0C = +									
[	{	22A2	⊢			22A4	⊤		
]	}	22A3	⊣			22A5	⊥		
\	|	21D6				21D8			
,	<	21D0				21D1		21D5	
.	>	21D2				21D3		21D4	
/	?	21D7				21D9			
Dead Key 11 w W									
,	<	21DA	⇐			290A	⤊		
.	>	21DB	⇒			290B	⤋		
Dead Key 1A [{									
,	<	21C7				21C8			
.	>	21C9				21CA			

Dead Key 1B] }									
,	<	21C6				21F5			
.	>	21C4				21C5			
Dead Key 1C \ |									
,	<	22D6	⋖			27D1	⟑		
.	>	22D7	⋗			27C7	⟇		
Dead Key 2A ' "									
,	<	02F1	˂			02F0	˄		
.	>	02F2	˃			02EF	˅		
Dead Key 31 x X									
9	(	2282	⊂			2286	⊆		
0	)	2283	⊃			2287	⊇		
-	_					2194	↔		
\	|	01C0	|			2195	↕		
,	<	25C4	◀			25B2	▲		
.	>	25BA	▶			25BC	▼		
Dead Key 36 m M									
,	<	02C2	<			02C4	^		
.	>	02C3	>			02C5	v		
Dead Key 37 , <									
,	<							226A	≪
Dead Key 38 . >									
.	>							226B	≫

See Understanding modifier key notation for an explanation of modifier codes.

Bidirectional text

Support for bidirectional text on the Q Keyboard is **preliminary**. Bidirectional text in Unicode is a complex topic, and the author's expertise is limited. With user feedback, it is possible this feature may be altered in future revisions of the Q Keyboard.

The Q Keyboard does not define any letters having **Right-to-Left** orientation, such as Arabic. It is expected that the primary use for the bidirectional feature will be in editing documents which already contain RTL text, or in which RTL is inserted from an outside source (such as pasting it from the Windows clipboard), since the keyboard itself cannot be used to type RTL.

> The Rial (Riyal) currency symbol ﷼ on ***AL] R*** is the only RTL character on the keyboard, but it is not a letter.

Users of this feature need to understand how the Unicode bidirectional algorithm operates. (See the link below.) The various control codes must be chosen carefully and inserted in just the right place, or else your data will be incorrectly formatted. These codes operate in ways that may be surprising and unexpected until you understand them, and can be challenging to use. In addition, you must know your environment.

Because bidirectional text in Unicode is a complex feature, not all software implements it correctly. Additionally, if you are working with an older version of a text editor, word processor or browser, some parts of the Unicode bidirectional text algorithm may not be implemented at all. If you encounter formatting problems, you should test your data with another editor or browser to try and isolate the cause. Upgrading your software to a more recent version may be required to use these control codes successfully.

Extensive resources are available online to help you understand and use Unicode bidirectional control codes. Here are a few links to get you started. An Internet search should turn up many other similar articles.

https://en.wikipedia.org/wiki/Bi-directional_text

https://translationtherapy.com/understanding-how-to-work-with-bi-directionality-bidi-text

https://www.iamcal.com/understanding-bidirectional-text

http://www.w3.org/International/questions/qa-bidi-unicode-controls

http://r12a.github.io/docs/bidi-plain-text/index.html

Your comments on bidirectional support, or any other aspect of the Q Keyboard, are welcomed, and may be emailed to info@qKeyboard.com. You can also submit questions and report issues on the Q Keyboard online forum located at http://qKeyboard.proboards.com.

The Q Keyboard allows you to directly insert Unicode control codes for **bidirectional text** into your data. You might use these when modifying a plain-text document in an editor or word processor. When composing web pages, it is customary to use **HTML tags** (also called **markup**) rather than directly embedding control codes. When tags are an option, you will find them easier to use than inserting codes. However, the codes can be helpful in non-HTML applications, or when dealing with situations where HTML doesn't provide everything you need.

Literature about Unicode bidirectional support often abbreviates this feature as **BIDI** or **Bidi**.

Guidance on the use of these codes was obtained from the Unicode Consortium.
Their documentation can be found here:

Unicode Standard Annex #9
Unicode Bidirectional Algorithm
http://www.unicode.org/reports/tr9/

Bidirectional control codes are generally zero-width, non-displayable data. They are identified by 3-letter acronyms such as **LRM** rather than with conventional character glyphs.

Finding a place on the keyboard for all these codes required a different approach than used for ordinary letters or symbols. We want to associate those locations with their acronyms. For instance, the most important part of the acronym **LRE** is **E**, so we want that code to somehow use the **E** key. It is also necessary to find room for these codes on some Dead Key, in a way that does not conflict with letters already there.

A bidirectional control code is a special kind of **Dead Key**, which is typed as follows:

1. Press Dead Key introducer **AA X**, then release both keys.

2. Hold the required modifier key, then type the letter key, as shown under **Keys** in the table. The modifier key will be either **CL** or **BL**, depending on the code you are typing. **Caps Lock** is ignored when you type the letter key. After you type the letter key, release the **CL** or **BL** modifier.

As discussed in Understanding modifier key notation, this is known as a special **AL/BL** or

AL/CL key sequence. The Shift key is not used.

The key sequences incorporate the most important letter from each acronym to help remember them. For instance, the most important letter of **LRE** is **E**. However, that letter is ambiguous, so you must also choose between the **CL** and **BL** modifier keys to select which code you mean, as shown in the table. For instance, **LRE** uses **AL X CL E** while **RLE** uses **AL X BL E**.

As with other Dead Keys on the Q Keyboard, if you type something incorrectly, you may see Dead Key Junk appear, rather than getting one of the bidirectional codes inserted. If this happens, simply backspace over the unwanted letters and try again.

> Since you will be using **AL X**, you could get ***non***-junk letters that are ordinary Dead Key characters. For instance, if you intended to type an **LRE** code with **AL X CL E** but forgot the **CL**, you would have typed **AL X E**, which produces **ɛ U+0258 Small Letter Open E** instead.

Bidirectional control codes generally take up no visible space. You only know they are present by the effect they have on your document, or if you use a technique like **Alt X** in Microsoft Word to display their Unicode hex values.

Because these codes are zero-width characters, and may also have an **RTL** attribute, it can be a challenge to find and delete one, since the cursor's orientation and the direction that a Delete or Backspace key does its deletion may be the opposite of what you expect. The **Alt X** technique might be your only practical choice in some cases.

> If you use **Alt X** to display a Unicode hex value, you must be careful **not** to use the Alt key that is mapped as the **AA modifier**. That is important, since the Dead Key you use to enter these control codes is **also** on the X key as **AA X**. If you incorrectly used **AA X** when you meant **Alt X**, just press the Spacebar. This will cause a Non-breaking Space to be typed. Then, delete that and try again.
>
> These codes *generally* take up no visible space. However, if your software does not implement part of the Unicode bidirectional algorithm, you may see a symbol with a square box having one of the BIDI acronyms inside, which indicates that a particular feature is not supported. Most fonts do not have such specialty symbols, but will show these positions as a blank or blank square. Even when a font has such square-box BIDI symbols, your application may or may not display it.
>
> The text editor **BabelPad** displays the Unicode value of the character to the right of the cursor. This is convenient if you want to test a key sequence without doing **Alt X** all the time. This software is produced by the same group that developed BabelMap.
>
> Their web site may be found at
> http://www.babelstone.co.uk/Software/BabelPad.html.
> Software is periodically updated, so be sure to check if you have the most current

version.

Example: To insert an **LRM** code via **AL X CL M**:

- Press Dead Key introducer **AA X**
- Release both keys
- Hold **CL** and type **M**

Remembering the key sequences

You should find the use of these control codes easy to remember if you consider each part of the key sequence separately, and think about the "purpose" of each part. After typing *AA X*, be sure to hold **CL** or **BL** until you have finished typing the final letter.

Examples:

To produce **LRE, for Bidirectional Left to Right Embedding** using **AL X CL E**:

- **AL X = Bidirectional**
- **CL = Left to Right (hold until you type next letter)**
- **E = Embedding**

To produce **RLM, for Bidirectional Right to Left Mark** using **AL X BL M**:

- **AL X = Bidirectional**
- **BL = Right to Left (hold until you type next letter)**
- **M = Mark**

Here is the complete list of supported control codes. **U+** is the Unicode value, and **ID** is its 3-letter code name from the Unicode documentation. Notice that the ID directly corresponds to the "Purpose" of the code, where the word TO is ignored.

For the POP control codes **PDF** and **PDI**, the representative letter for **PDF** is **F**, but **PDI** is a problem, since **I** is already used by other codes. To resolve this, its letter becomes **L**, for the second half of the word ISO***LATE***. This is not the most ideal notation, but it should not be too difficult to remember with practice.

All of the descriptive information below is derived from the Unicode document cited at the beginning of this article. Though the Unicode Consortium does make its information publicly available, we wish to acknowledge its copyright on these materials.

U+	Keys	ID	Purpose and description

202A	AA X CL E	LRE	LEFT-TO-RIGHT *EMBEDDING* Treat the following text as embedded left-to-right
202D	AA X CL O	LRO	LEFT-TO-RIGHT *OVERRIDE* Force following characters to be treated as strong left-to-right characters
2066	AA X CL I	LRI	LEFT-TO-RIGHT *ISOLATE* Treat the following text as isolated and left-to-right
200E	AA X CL M	LRM	LEFT-TO-RIGHT *MARK* Left-to-right zero-width character
202B	AA X BL E	RLE	RIGHT-TO-LEFT *EMBEDDING* Treat the following text as embedded right-to-left
202E	AA X BL O	RLO	RIGHT-TO-LEFT *OVERRIDE* Force following characters to be treated as strong right-to-left characters
2067	AA X BL I	RLI	RIGHT-TO-LEFT *ISOLATE* Treat the following text as isolated and right-to-left
200F	AA X BL M	RLM	RIGHT-TO-LEFT *MARK* Right-to-left zero-width non-Arabic character
2068	AA X CL S	FSI	FIRST *STRONG* ISOLATE Treat the following text as isolated and in the direction of its first strong directional character that is not inside a nested isolate
061C	AA X CL A	ALM	*ARABIC* LETTER MARK Right-to-left zero-width Arabic character
202C	AA X CL F	PDF	POP DIRECTIONAL *FORMATTING* End the scope of the last LRE, LRO, RLE or RLO
2069	AA X CL L	PDI	POP DIRECTIONAL ISO*LATE* End the scope of the last LRI, RLI or FSI

See Understanding modifier key notation for an explanation of modifier codes.

Black Letter capitals

The Q Keyboard supports typing of **Black Letter Capitals**, using ***Held Key AU]*** which requires Shift.

The 5 characters in the table are the only black letter capitals defined in Unicode. As with other less-frequently used symbols, you need to test your font to confirm it has the letters you need. Black letter capitals are not well-represented in many fonts. The table below uses DejaVu Sans for the symbols, as it has the complete set.

Black Letter Capitals are often used as math symbols. The commonly-understood math operations are shown in the table. Since math symbols can be used for more than one purpose, you should confirm that the symbols you select are appropriate for your purposes. Operations noted for C and Z are believed correct but are subject to revision.

Held Key	Sym	U+	Math operation
AU] C	ℭ	212D	Complex
AU] H	ℌ	210C	Hilbert space
AU] I	ℑ	2111	Imaginary part
AU] R	ℜ	211C	Real part
AU] Z	ℨ	2128	Z axis

See Capitalization rules for a discussion of upper-case Held Key characters.

See Understanding modifier key notation for an explanation of modifier codes.

Box drawing symbols

The Q Keyboard allows you to type Box Drawing symbols. You can use them to create simple forms in a text editor. You will generally need to use a monospaced font such as Courier New or Dejavu Sans Mono to properly format boxes.

> Recommendation for font vendors. When implementing the box drawing characters, ensure that the glyphs for each box symbol, and the symbols for Em Dash and Em Space, are of identical width. That will make it easy for users to compose box diagrams even using fonts that are not monospaced. All box drawing characters defined in the WGL4 list should be included, even ones not directly addressable by the Q Keyboard.

You can type either single-line boxes, or double-line boxes. Unicode does define additional Box Drawing symbol types, such as **transitions** between single and double lines, and symbols with different line widths. These additional symbols are not supported.

> The Q Keyboard does not support the **transition** Box Drawing symbols that are present in WGL4. These were omitted because they were of lower priority, and to save space for more important features. In addition, it would hard to "categorize" such transition symbols so that keys could be assigned to them in a way that users would understand and remember. Adding these would be confusing and difficult to explain, and few people would likely use them.

Box Drawing symbols are typed as ***Held Keys*** using ***AA 3***. For double-line characters, use ***AA+Shift*** (shown as ***AU*** below) and for single-line characters, just use ***AA*** (shown as ***AL*** below).

Each set of 11 symbols has four "**L**" corners, four "**T**" junctions, one "**+**" intersection, plus a **–** horizontal and a **|** vertical symbol.

Horizontal symbols appear on the **H** key, and vertical symbols appear on the **V** key. For the remaining symbols, the Q Keyboard assigns these to the left-most three letters of each letter row, those being **QWE**, **ASD** and **ZXC**. These nine keys form a "box pattern" so you can visualize which "piece" of the box you are typing, by associating this "grid" of keys with the various parts of a box you are trying to type.

> Note: These key assignments presume the QWERTY layout variant. See below for more information.

> Why was **H** used for horizontal and **V** for vertical? Couldn't a case have been made to use the keys with the **–** and the **|** symbols on them? Yes. The problem is that those keys are on the far right of the keyboard. Using them for this purpose would cause increased hand movement between the right side and the cluster of 9 keys on the left. We use **H** and **V** for ease of typing.

Single-line Box Drawing ***Held Key*** symbols

	AL 3 ***H***				─	
AL 3 ***Q***	***AL 3*** ***W***	***AL 3*** ***E***		┌	┬	┐
AL 3 ***A***	***AL 3*** ***S***	***AL 3*** ***D***		├	┼	┤
AL 3 ***Z***	***AL 3*** ***X***	***AL 3*** ***C***		└	┴	┘
	AL 3 ***V***				│	

Double-line Box Drawing ***Held Key*** symbols

	AU 3 **H**				═	
AU 3 **Q**	***AU 3*** **W**	***AU 3*** **E**		╔	╦	╗
AU 3 **A**	***AU 3*** **S**	***AU 3*** **D**		╠	╬	╣
AU 3 **Z**	***AU 3*** **X**	***AU 3*** **C**		╚	╩	╝
	AU 3 **V**				╫	

Box Drawing with QWERTZ and AZERTY variants

The scheme for assigning letters to Box Drawing symbols is dependent on the QWERTY keyboard layout for the "box pattern" shown above.

To accommodate the **QWERTZ** variant where keys **Y** and **Z** are swapped, the Q Keyboard **duplicates** on key ***AA 3 Y*** the same Box Drawing symbols present on key ***AA 3 Z***. So, the same "box pattern" can be used for either QWERTY or QWERTZ.

However, for the **AZERTY** variant, it is not possible to make such an accommodation, because 4 of the 9 keys in the "box" get relocated, and there is no feasible way to fix that. When using AZERTY, you will have to refer to the tables above to draw boxes, which will still be possible to do but will be less convenient.

- If you normally use the AZERTY variant, it may be possible to temporarily change the layout to QWERTY or QWERTZ to draw the boxes, then change back when you are finished.

- If you have a hardware-defined Q Keyboard with auxiliary key legends for AZERTY, you can use them as a guide to type the right key. For instance, say you want the line drawing symbol shaped like a **T**. On QWERTY, this is on the **W** key. On keyboards with auxiliary AZERTY key legends, the **W** key would also have an auxiliary legend of **Z**, since this key is **Z** on AZERTY. Thus, the correct key to produce the **T** symbol would be on the QWERTY **Z** key.

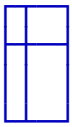
Example: Single-line box

To follow this example, hold down the **AA** key (***AL***). For each letter that appears in the pattern below, first type the **3** key, and then the key shown, alternating between the two for each letter. Where you see a dash (**-**) in the pattern, **just press the Spacebar** without the **AA** or **3** keys. At the end of each line, release the **AA** key, press Enter, then resume holding the **AA** key as you continue with the example.

Letters used in box pattern:

```
Q W H E
A S H D
V V - V
Z X H C
```

Result:



Example: Double-line box. Using the same pattern above, hold **AA**+Shift (***AU***) instead of **AA** (***AL***).

Result:

See Understanding modifier key notation for an explanation of modifier codes.

Chess and games

Chess pieces

The Q Keyboard allows you to type the symbols for **Chess notation**. As customary, the first letter of each piece is used to identify it, except for **Knight**, which is indicated by **N**.

These characters are on the **AA : Dead Key** (normally used for **Diaeresis**).

White pieces are typed as if **lower-case**, and **black** pieces are typed as if **upper-case**.

Because these symbols are treated as if they were **letters**, all the usual Capitalization rules apply.

U+	Sym	Key Sequence	Description
2654	♔	DEAD AL ; K	WHITE CHESS KING
2655	♕	DEAD AL ; Q	WHITE CHESS QUEEN
2656	♖	DEAD AL ; R	WHITE CHESS ROOK
2657	♗	DEAD AL ; B	WHITE CHESS BISHOP
2658	♘	DEAD AL ; N	WHITE CHESS KNIGHT
2659	♙	DEAD AL ; P	WHITE CHESS PAWN
265A	♚	DEAD AU ; K	BLACK CHESS KING
265B	♛	DEAD AU ; Q	BLACK CHESS QUEEN
265C	♜	DEAD AU ; R	BLACK CHESS ROOK
265D	♝	DEAD AU ; B	BLACK CHESS BISHOP
265E	♞	DEAD AU ; N	BLACK CHESS KNIGHT
265F	♟	DEAD AU ; P	BLACK CHESS PAWN

Playing card symbols

Only the black symbols are supported, since the white symbols are present in few fonts.

U+	Sym	Key Sequence	Description
2660		*HELD AL 1 S*	BLACK SPADE SUIT
2663		*HELD AL 1 C*	BLACK CLUB SUIT
2665		*HELD AL 1 H*	BLACK HEART SUIT
2666		*HELD AL 1 D*	BLACK DIAMOND SUIT

Checkers (Draughts) symbols

U+	Sym	Key Sequence	Description
26C0		*HELD AL ; W*	WHITE DRAUGHTS MAN
26C1		*HELD AU ; W*	WHITE DRAUGHTS KING
26C2		*HELD AL ; B*	BLACK DRAUGHTS MAN
26C3		*HELD AU ; B*	BLACK DRAUGHTS KING

Circled numbers

The Unicode standard defines hundreds of circled numbers, letters, math symbols and other characters. The Q Keyboard has some of the circled math symbols, plus the circled numbers **0** to **20** appearing below.

> Unicode has definitions for circled numbers going as high as **50**, but very few fonts contain the higher-numbered symbols. In the author's font collection, only 9 fonts out of 160 had the higher symbols, and all but one were designed for Asian scripts. The only general purpose font found with all these characters was Quivira.

Font coverage of circled numbers is uneven. Many fonts do not support them at all, some only have numbers 1 to 10, and some with numbers 1 to 20 do not have the circled digit zero. In addition, some fonts that do have all numbers from 0 to 20 may render them in different sizes, such as a small size for 0 to 10 and larger for 11 to 20. You will have to choose your font carefully to use these characters. Among common fonts, Calibri, Arial Unicode MS, Segoe UI Symbol and Quivira had all of the characters.

The table below uses Calibri, which is attractive and readable, and renders all numbers in the same size. Calibri's symbols are somewhat larger than capital letters of corresponding size. If this is an issue, you may wish to adjust your font size, or select another font whose circled numbers are closer in size to letters. To illustrate, the **table** shows Unicode code points like **2460** in Calibri 16 while symbols like ① are in Calibri 14.

All of the symbols are ***Held AU***, so you will need to hold **AA+Shift** to type them. plus a digit

As seen below,

- circled numbers from **0** to **9** are on ***Held Key AU –*** plus a digit
- circled numbers from **10** to **19** are on ***Held Key AU =*** plus a digit
- circled number **20** is on ***Held Key AU ' 0*** (zero)

Note: The Unicode definitions for these characters may be seen as starting from **1**, while the Q Keyboard considers them as starting from **0**. That is important when using key **0** to type one of the symbols. For instance, ***Held Key AU – 1*** through ***Held Key AU – 9*** produces ① through ⑨ while ***Held Key AU – 0*** produces ⓪ rather than ⑩.

Example: Produce circled digit **17**:

- press and continue to hold ***AA+Shift***
- type **=** for the circled numbers in the range 10-19
- type **7**
- the character ⑰ appears
- release all keys

To emphasize that symbols ⓪ ⑩ and ⑳ are out of order numerically, these are shown

as **black on yellow**.

QWERTY Keys		AA Dead Key Symbols				*AA Held Key Symbols*			
LC key	UC key	AL u+	AL sym	AU U+	AU SYM	AL u+	AL sym	AU U+	AU SYM
Dead Key 0B - _									
1	!					02E5	˥	2460	①
2	@	01BB	ƛ			02E6	˦	2461	②
3	#	21B0				02E7	˧	2462	③
4	$	21B1				02E8	˨	2463	④
5	%	21B2				02E9	˩	2464	⑤
6	^	21B3						2465	⑥
7	&	21B4						2466	⑦
8	*	21B5						2467	⑧
9	(							2468	⑨
0	)					0336	◌̶	24EA	⓪
Dead Key 0C = +									
1	!							246A	⑪
2	@	224D	≍			226D	≭	246B	⑫
3	#	2056	∺			10FB	∺	246C	⑬
4	$	2058	∻					246D	⑭
5	%	2059	∽					246E	⑮
6	^					A69D	ᵇ	246F	⑯
7	&							2470	⑰
8	*	225B	≛			2257	≙	2471	⑱
9	(					035E	◌͎	2472	⑲
0	)	1DCC	◌̾			035F	◌͟	2469	⑩
Dead Key 2A ' "									
0	)	2440	⑀					2473	⑳

Currency symbols

In addition to the standard **$** dollar sign on Shift **4**, the Q Keyboard supports a wide range of international currency symbols. Nearly all currencies in active use world-wide can be represented.

Consult Currency cross-reference to find the correct currency symbol for the country or region you are interested in.

Information about world currencies was found at:
https://en.wikipedia.org/wiki/Currency_symbol and other sources.

Some of this information may become inaccurate or out of date. Countries can and do occasionally revise their economic systems and adopt new currency symbols and representations. Should you find any errors in the currency tables in this document, please forward any corrections to the author. Your assistance will be appreciated.

Notes:

- Currencies written in Arabic are not supported, because that is outside the scope of the Q Keyboard design. These have names such as *denar*, *dinar*, *dirham*, *riyal* and *rial*, and use abbreviations in Arabic letters. There are currencies using *denar* or *dinar* with Cyrillic names instead of Arabic. The Cyrillic names are supported.

- The Riyal (Rial) currency symbol specifically used in Saudi Arabia is supported, because it is a symbol and not an Arabic letter *per se*. Other nations with riyal/rial currencies also use this symbol, but not all of them. See note below about right-to-left characters.

- Some currencies use a dollar sign with two vertical lines instead of one. There is no Unicode symbol for this. It can be simulated with an S plus a double-vertical combining modifier, but in most cases this will not render well. Because of that problem, countries that officially have a double-line dollar sign will in practice use a common **$** dollar sign instead. Many nations use the common **$** dollar sign alone, or a dollar sign plus some Latin letters or ordinary punctuation. Some, but not all, of these currencies are mentioned in the currency cross-reference list. A national currency may be omitted from the list when its characters are simple and obvious, needing no further explanation.

  There is a currency symbol in Unicode called **U+1F4B2 Heavy Dollar Sign**, which might be used as a substitute. It looks a lot like a regular dollar sign but rendered in Bold. However, at present its font availability is extremely limited, and is not supported on the Q Keyboard.

  To create a double-line $ sign, start with a capital **S**, and type ***Held AU ***

In Everson Mono, one of the few fonts where this will work, it looks like this: ⱣⱣ

- Many historical currency units are supported, where there is sufficient font support to justify it.

- Currency signs associated with several non-Latin languages in the Middle East and Asia, often called "rupee" or a word similar to it, are defined on the Q Keyboard, although they are poorly represented in fonts not intended for those languages. If you plan to use any of these symbols, be sure to test your font for availability.

- For ***Held Key*** symbols, every effort was made to associate the particular key used with either the name of the country or the name of the denomination, such as **K** for the ₭ Kip symbol. Because so many symbols exist, this was not always possible, and for these the characters were placed wherever space was available. In a few instances, the letter chosen resembles the shape of the corresponding symbol, such as the Kannada and Sinhalese Rupee signs, which look somewhat like the letter **O**.

  In some cases, certain key sequences that would have been desirable could not be used because they were committed to other purposes. A conscientious effort was made to select the best key assignments possible, given the Held Key locations available. During the development phase, certain possible alternatives were considered, which may have been equally good, in cases where there seemed to be no obvious 'correct' choice. With user feedback, if there were key assignments that could be improved upon to make them easier to type or to remember, it will be considered in a future revision of the Q Keyboard.

Currency symbols produced with **CL** or **CU (CC+Shift)** modifiers

Live Key	Sym	U+	Description
CL 2	¢	00A2	Cent sign
CL 3	£	00A3	Pound symbol *
CL 4	€	20AC	Euro sign †
CU 4	· €	20AC	Non-breaking space + Euro sign ‡
CL 7	¥	00A4	Yen

* The **Pound** symbol **£** is located on the **3** key, which also has the **#** symbol on it. The **#** symbol is commonly referred to as a "pound sign" in the United States and Canada.

† Many international keyboards use **AltGr + E** for **€**. The equivalent of this on the Q Keyboard would have been **AL E**, but that key sequence is already defined as the **Live Key** for **ë with Diaeresis**. Most users will find **CL 4** easy to type. **Live Key AC E** is used for

the ᵉ French ordinal symbol. Because **€** is likely to be heavily used among all the currency symbols, ease-of-use was deemed more important than compatibility with other international keyboards. The Held Key version of the Euro is on ***AL [E***

‡ For **CU 4**, the symbol consists of a Non-breaking space (indicated by the **· dot**) and then the **€** Euro. According to published Euro usage guidelines, in English, Dutch, Irish and Maltese, the Euro precedes the amount without intervening spaces. In other EU languages, such as French, the amount should be followed by a space, then the Euro sign. When available, that space should be a non-breaking space, as is the case on **CU 4**

https://en.wikipedia.org/wiki/Euro_sign
http://publications.europa.eu/code/en/en-370303.htm

Currency symbols produced with **AC (AA+CC)** modifiers

Live Key	Sym	U+	Description
AC B	฿	0243	Proposed Bitcoin sign
AC F	ƒ	0192	Florin or Guilder
AC I	₹	20B9	Indian Rupee
AC P	₽	20BD	Ruble sign
AC U	₫	20AB	Vietnamese Dong
AC W	₩	20A9	Won sign †
AC Y	¤	00A4	Generic currency symbol ‡

† The **Won** sign on **AC W** is provided for compatibility with the AFNOR AZERTY keyboard. This can also be typed as ***Held Key AL [W***

‡ Since the Q Keyboard supports nearly all currency symbols world-wide (except those written with Arabic letters), there may be less demand for the generic ¤ symbol, which is normally used to signify a currency when its correct symbol is not available. The only limitation you may face is availability of a desired currency symbol in your preferred font.

Unlike some keyboards which use ¤ as a "currency dead key" (such as recent French keyboard standards from AFNOR), on the Q Keyboard this is an ordinary symbol.

Currency symbols produced as Dead Keys

The keyboard has only one **Dead Key** symbol, the ¤ Generic Currency, on **AL 4 4**. To type this, hold **AA** and type the **4** key, then release all keys and type the **4** key a second time. Do not use Shift. This is being made available as a convenience and an alternative to **AC Y**

because it may be easier for some to type.

If this is incorrectly typed as a ***Held Key*** instead of a **Dead Key**, it will produce the Combining Greek Dialytika Tonos accent. This is somewhat different from the typical use of Dead Keys, which usually have complementary combining accents. The Greek Dead Key only has the one.

Currency symbols produced as Held Keys

Unicode defines a block of 32 symbols in the range of **U+20A0** to **U+20BF** for international currency symbols. The Q Keyboard allows all of the defined symbols to be typed. (An adjacent block of 16 more symbols is reserved, but not yet defined.) There are also currency symbols outside of this block.

Currency symbols not on **Live Keys** are produced as ***Held Keys***, and are assigned as follows:

- ***AA [*** is used for the most frequently used symbols, for larger countries and regions.
- ***AA]*** is used for less-frequent symbols, for smaller countries and regions, or when the associated key on ***AA [*** is occupied.
- ***AA *** is used in a few cases where ***AA [*** and ***AA]*** are both occupied and a third symbol must be accommodated.
- ***AA /*** is currently used only for the ฿ Thai Baht symbol.

Notes:

- The symbol proposed for the digital currency **Bitcoin** at **U+20BF** received final approval from the Unicode Consortium in June of 2017. Proponents of Bitcoin have also advanced the use of **Capital Letter Ƀ with Dash Stroke** as a symbol, according to the web site http://bitcoinsymbol.org/. Letter **Ƀ** is available as a Dead Key on **AU – B** and as a Live Key on **AC B**. Since approval of U+20BF for Bitcoin was very recent, it will be some time before it is present in popular fonts. Fonts supplied in Windows 10, such as Arial, Courier New, Segoe UI and TImes New Roman have the complete block from U+20A0 to U+20BF defined, and Calibri has most of them including BitCoin. The Bitcoin is not visible in all Help readers, so it is shown here as an approximation.
- Should the **U+20BF** Bitcoin symbol become commonly available in the majority of popular fonts, it is possible it could replace the **Ƀ with Dash Stroke** currently on **AC B** in a future revision of the Q Keyboard. Currently, there are no plans to do this.
- Another digital currency in current use is ***Ether*** or ***Ethereum***. The symbol for this is Greek Capital Letter **Xi Ξ** at **U+039E**, which is available as **Dead Key AU 4 J**.

- The **Thai Baht** ฿ is at **U+0E3F.** At times, some have suggested using **Thai Baht** as a substitute Bitcoin symbol. Because that could cause ambiguity, use of Baht for Bitcoin is losing favor and is not recommended.

- The **Armenian Dram** ֏ is at **U+058F**, and is present in few fonts. The current design of the Armenian Dram symbol has existed only since 1995.

- The **Script M** symbol ℳ at **U+2133** on ***Held AU [M*** was previously used for the **German Mark** until replaced by the Euro. This is the only symbol in the table that requires the use of **Shift**. Technically, Unicode does not consider ℳ to be a currency sign, but merely a "Letter-like symbol". Additional related letters can be found in the article Script capitals.

- The Chinese and Japanese **Yuán** signs are sometimes used instead of the international **¥** Yen symbol. These symbols are present in few fonts. The list below renders them in Arial Unicode MS. The Traditional and Simplified Chinese Yuán symbols can be very hard to distinguish. The Simplified symbol is only slightly 'simpler' than the Traditional one, and they have a similar appearance.

- The **U+09F2** ৲ **Bengali Rupee** ***Mark*** on ***AL] *** is used for historic currency representation, normally with Bengali script. Notice how the **Mark** symbol ৲ resembles the **\ Backslash** character. To specify Bengali Rupees as part of a Latin-language document, use the **U+09F3** ৳**Bengali Rupee** ***Sign*** instead, found on ***AL] B*** • The Rupee **Sign** is also known as **Taka**.

- Because of the similarity of appearance in the Turkish Lira ₺ and Bengali Taka ৳use care in typing.

- The Cambodian Riel and the Afghani currencies may be rendered as very small glyphs in some fonts. You may need to choose your font carefully, or increase the font size used, to improve the readability of these characters.

The **Rial sign** ﷼ at **U+FDFC** on ***AL] R*** is a **right-to-left** character. If you intend to use it, be sure to test your fonts, as its availability is limited.

If you insert this symbol into your document, cursor movement and editing actions when you are near this symbol (like insert and delete) will go in the opposite direction of what you would expect. If you are not accustomed to this counter-intuitive behavior, it can be confusing and challenging to work with. It may be easier to type all of your Left-to-Right characters **first** on a line, and then insert the Rial sign as the last thing you do, to minimize this problem. If you need to delete this character, rather than using a Delete or Backspace key alone, it may be best to **highlight** the

character first, and **then** delete it. Hold the Shift key, and press the ← or → key to highlight it, being aware that **you may have to use the arrow key opposite of the one you think you should**. See Bidirectional text for more information.

Because of these issues, a good case could be made for the Unicode Consortium to add a new character with the same glyph appearance as the existing Rial sign, but with a left-to-right orientation. (Technically, such a proposed symbol would have the same left-to-right "Bidi Class" and other font attributes that are used by the common U+0024 **$** sign character.)

If this were done, it would make it easier to insert ﷼ into documents (such as financial statements) that only had left-to-right characters except for the Rial. Accomplishing that would require an interested party to submit a formal proposal to the Consortium to add this new character to Unicode.

A good name for this symbol would be **LEFT-TO-RIGHT RIAL SIGN**. A nearby unused code point where this could be placed is **U+FDFE**.

In the table below, entries with a **yellow background** have a key sequence **other than** ***AL [*** or ***AL]***. This is a reminder to **look more closely** at the keys you need to use.

Entries with a **light blue background** have no currency symbols associated with that letter at this time. For instance, there is no Held Key currency for ***AL [V*** defined, so the entry shows ***--V--*** as a placeholder.

When a symbol contains characters in **blue background**, they are ordinary QWERTY characters that are typed as-is. An example of this is the Cedi currency **GH₵**. The Unicode **U+** value you see is only for the part of the currency symbol that does **not** have a blue background. In the Cedi example, only the **₵** character is represented by the **U+** value and the key sequence shown.

- Entries marked with a **Country** of ***** either have no country associated with them, or have more than one.

- Entries marked with an **ISO** of **-** have no ISO code assigned, or the code was not determined.

- The spelling of currencies generally follows the Unicode documentation. This may differ from official sources, such as **Riyal** vs. **Rial**.

The following symbols are **not present on *Held Keys***. Use the keys as noted:

- The Cent sign ¢ is on **Live Key CL 2**
- The British Pound symbol £ is on **Live Key CL 3**
- The Yen ¥ on **Live Key CL 7**
- The Generic currency symbol ¤ is on **Live Key AC Y** and on **Dead Key AL 4 4**

Country	Denomination	ISO	Sym	U+	*Held Key*
Thai	Baht	THB	฿	0E3F	*AL / B*
Armenian	Dram	AMD		058F	*AL [A*
*	Bitcoin	BTC	₿	20BF	*AL [B*
Costa Rican	Colón	CRC	₡	20A1	*AL [C*
Vietnamese	Dong	VND	₫	20AB	*AL [D*
*	Euro	EUR	€	20AC	*AL [E*
Aruban	Florin	AWG	ƒ	0192	*AL [F*
Paraguayan	Guaraní	PYG	₲	20B2	*AL [G*
Ukrainian	Hryvnia	UAH	₴	20B4	*AL [H*
Indian	Rupee	INR	₹	20B9	*AL [I*
North Indic	Rupee	-	؋	A838	*AL [J*
Lao	Kip	LAK	₭	20AD	*AL [K*
Italian	Lira	ITL	£	20A4	*AL [L*
Azerbaijani	Manat	AZN	₼	20BC	*AL [M*
Nigerian	Naira	NGN	₦	20A6	*AL [N*
Kannada	Rupee	-	ರ	0CB0	*AL [O*
Russian	Ruble	RUB	₽	20BD	*AL [P*
Cambodian	Riel	KHR	₾	17DB	*AL [Q*
*	Rupees	-	Rs	20A8	*AL [R*
Israeli	Shekel	ILS	₪	20AA	*AL [S*
Turkish	Lira	TRY	₺	20BA	*AL [T*
					-- U --
					-- V --
Korean	Won	KPW	₩	20A9	*AL [W*
Brazilian	Cruzeiro	BRB	₢	20A2	*AL [X*
Chinese	Yuán traditional	CNY	圓	5713	*AL [Y*
					-- Z --
Spanish	Peseta	ESP	Pts	20A7	*AL \ P*
Mongolian	Tugrik	MNT	₮	20AE	*AL \ T*
Bengali	Rupee Mark	-	৲	09F2	*AL] *
Argentine	Austral	ARA	₳	20B3	*AL] A*

Bengali	Rupee Taka	BDT	৳	09F3	*AL] B*
Ghana	Cedi	GHS	GH₵	20B5	*AL] C*
Greek	Drachma	GRD	₯	20AF	*AL] D*
*	Euro Currency	-	₠	20A0	*AL] E*
*	Franc	-	₣	20A3	*AL] F*
German	Penny	-	₰	20B0	*AL] G*
French	Livre Tournois	-		20B6	*AL] H*
Chinese	Renminbi	CNY	元	5143	*AL] I*
Japanese	Yuán Shinjitai	JPY	円	5186	*AL] J*
					-- K --
Georgian	Lari	GEL	₾	20BE	*AL] L*
*	Mill	-	₥	20A5	*AL] M*
Nordic	Mark	-		20BB	*AL] N*
Sinhalese	Rupee	-	ල	0DD4	*AL] O*
Philippine	Peso	PHP	₱	20B1	*AL] P*
Gujarati	Rupee	-	રૂ	0AF1	*AL] Q*
*	Rial	-	﷼	FDFC	*AL] R*
					-- S --
Kazakhstani	Tenge	KZT	₸	20B8	*AL] T*
					-- U --
					-- V --
Afghan	Afghani	AFN	؋	060B	*AL] W*
*	Spesmilo	-	₧	20B7	*AL] X*
Chinese	Yuán simplified	CNY	圆	5706	*AL] Y*
Tamil	Rupee	-	ரூ	0BF9	*AL] Z*
German	Mark	DEM	ℳ	2133	*AU [M*

See Understanding modifier key notation for an explanation of modifier codes.

Cyrillic in Latin Alphabets

The Q Keyboard has an extensive complement of Cyrillic letters.
This is discussed in more detail in Part 7.

There are certain languages which have historically been written in both Cyrillic and Latin. When these alphabets were converted to Latin, sometimes a few Cyrillic or Cyrillic-like letters were retained, when it was felt that Cyrillic did a better job of representing the original letters or sounds. Some of these alphabets may also incorporate Greek letters as replacements for certain Cyrillic letters.

Latin languages that retain Cyrillic letters were researched very carefully, and all that were found are included as part of the Cyrillic support on the Q Keyboard.

Handling the Chechen language

Some alphabets with Cyrillic also have Latin letters requiring composition. Chechen has the letters **ç Ç** with **Dot Above**, and **q Q** with **Dot Above**, which are not in Unicode. You would type these by starting with regular **ç Ç** and **q Q** and adding a Dot Above combining symbol, by typing ***AL . .*** afterwards. It may be possible to substitute **ç̇ Ç̇** for **ç Ç** with **Dot Above** to avoid doing the composition, if that letter is close enough for your needs. Letter **ç̇ Ç̇** can be found on Held Key ***AA , C***

> In case you were wondering, these compositions don't always work well with every application, and it turns out that includes some PDF and CHM viewers. So, these are simply described above, without us trying to actually show you examples of them. The letter **q Q** in particular is a problem because it is rarely accented, and many fonts don't include the correct attributes to make it possible to do this correctly. Two fonts where accents can be successfully added to **ç Ç** and **q Q** are Gentium Plus and Gentium Plus Compact.

Not every letter of every alphabet can be fully supported. The older Chechen alphabet had two ligatures resembling **IE** and **UO** that were considered single letters, but were not initially added to Unicode. Latin-based Chechen has since been revised and does not contain these ligatures. If you wanted to type the older script, you would have to use the resources of the Q Keyboard to devise some kind of substitute symbols. If you do this, it is with the understanding that the results would not look identical to those original letters.

The following suggestions may be a practical approach:

For Latin ligature IE

Use Cyrillic **Ѥ** at U+0464, which closely resembles Latin **IE**. This letter is called an "Iotified

E". Recent versions of Unicode have the lower-case Latin ꭼ (**ꭼ**) at U+AB61. (The ligature ꭼ (**ꭼ**) is present in very few fonts, and may be undisplayable in the Q Keyboard CHM Help, because it was only incorporated into the Unicode standard as of version 8.0. See Suggested fonts for more information.) If the Latin lower-case ꭼ (**ꭼ**) is not available in your font, the Cyrillic **ѥ** at U+0465 could be used instead.

An alternative that avoids use of Cyrillic or the Latin **IE** ligature is Latin **I** plus Latin **Open E**, giving **IƐ** and **iɛ**. The lower-case form could also use a dotless **ı**, giving **ıɛ**. These forms are distinctive, and the letters are present in many fonts. **IƐ** and **ıɛ** are probably the most attractive and practical of these various approaches.

A substitute that retains a standard E but alter the letter **I** is **Ɨ with Dash Stroke**. This would result in the digraphs **ƗE** and **ɨe**.

For Latin ligature UO

There is no Cyrillic equivalent of **UO**. The Cyrillic letter **Ю ю** somewhat resembles **UO**, though imperfectly. The letter **V with Hook** followed a letter **O** as **UO** is similar to the Latin **UO**. Recent versions of Unicode have the lower-case Latin ꭿ (**ꭿ**) at U+AB53. (The ligature ꭿ (**ꭿ**) is present in very few fonts, and may be undisplayable in the Q Keyboard CHM Help, because it was only incorporated into the Unicode standard as of version 8.0.) If ꭿ (**ꭿ**) is not available or undisplayable in your font, the lower-case **V with Hook** and **O** as **ʊo** could be substituted.

An alternative that avoids use of the Latin **UO** ligature is Latin **V** with Hook plus Latin Open **O**, giving **ƲƆ** and **ʊɔ**, or with Latin **U** and Open **O**, giving **UƆ** and **uɔ**. Either of these forms are distinctive, and the letters are present in many fonts.

Because the **UO** ligature looks something like an **M** turned upside down, the inverted **M** letter **Ɯ ɯ** or even the Cyrillic **Ш ш** could also possibly serve as a substitute, though not as good as **UƆ** and **uɔ**.

Guidelines for using Cyrillic

Instead of exhaustively listing all the letters you might need, the following guidelines are offered. Similar to what is needed for typing various African languages, you will need to be familiar with the full range of Q Keyboard capabilities, since several different kinds of Dead Key letters are needed. You also need to know what is available in the list of Live Keys, as certain Live Key letters can be used as well.

These features will help you in typing Latin languages with retained Cyrillic letters:

- Key W has most Cyrillic letters, including the Cyrillic "Barred O"
- Key 0A (0) has the lower-case Latin ꭼ (**ꭼ**) and ꭿ (**ꭿ**) for Chechen as Held Keys ***AL 0 I***

and ***AL Ø U***

- Key 06 has many extra Cyrillic letters that could not fit in Key 11, and also has the letter **Ꙍ ꙍ**
- Key 02 and Key 0B (–) have the Latin "Barred O" letter
- Key 04 has Greek letters you may need
- Key 05 has both Ogonek and Descender letters; many of the descenders are Cyrillic
- Key X and Key M have several useful characters

See Cyrillic Key Guide for a complete list of all Cyrillic Dead Key letters not on Key W.

Be sure you understand how to apply combining modifiers, as these may be needed. Most often, if you need to apply a combining accent, it will be the Acute. You may occasionally need a Grave accent or Diaeresis.

Cyrillic letters in the Dead Key Guide

Within the Dead Key Guide, when a key contains Cyrillic letters, most of them are shown as black letters on an **orange** background:

j	**J**	**0135**	**ĵ**	**0134**	**Ĵ**	**0529**	**ԩ**	**0528**	**Ԩ**

Some Cyrillic letters look exactly like other Latin letters, or nearly so, and there is a risk of unintentionally typing the wrong one. (Such pairs of "cognate" letters are called "homographic glyphs".) To highlight situations like this, the Cyrillic letters have a **green** background instead of **orange**. In nearly all cases like this, Cyrillic will be on ***Held Keys*** and non-Cyrillic on **Dead Keys**. When you see the **green** background, it's a reminder to use extra care when typing these letters so that the **AA** key is held correctly for the letter you want.

e	**E**	**00E8**	**è**	**00C8**	**È**	**0450**	**ѐ**	**0400**	**Ѐ**

In a few cases, a Cyrillic letter is also a modifier letter. This is indicated by a medium blue background for the Unicode code point, and an orange background for the character itself, like this:

h	**H**	**1E96**	**ẖ**			**1D78**	**ᴴ**		

For Dead Key W, every letter is Cyrillic, so the regular blue and red display is used.

A word about Barred O

There is a pair of letters which are Small O with Middle Tilde and a Capital letter known as

"Barred O".

> Even though the lower case letter is called "O with Middle ***Tilde***", all available fonts appear to render the "middle" part like a straight line, **not** as a Tilde. The net effect is that both of these letters might as well have been called "Barred O" letters, but the Unicode standard doesn't do that.

There are also separate letters in the Cyrillic range that are also called "Barred O". The Q Keyboard allows you to type either of these. On Key W, you get **true Cyrillic** Barred O letters; on other keys it is the **Latin** Barred O. If you are only printing or displaying these letters, in most fonts they will look identical. If you have some software that is processing these letters and it expects specific code-point values, review the Dead Key documentation to be sure you are selecting the right ones.

You must be careful when using Key 06. Besides what is noted above, there is **another** similar-looking letter on ***AA 6 0*** (zero) called a Cyrillic **Fita**, which looks like the letter O with a Tilde inside it. (In several fonts, this one **does** look like a Tilde, but not in all of them.) Fita has the Unicode values of U+0472 and U+0473. You will need to watch carefully to make sure you use the right letter for the right purpose.

<u>Example alphabets</u>

To give you an idea what some of these languages look like, the following references from the **Omniglot** web site http://www.omniglot.com/writing/langalph.htm may be of assistance.

There are languages that were first written in Cyrillic and then in Latin, then changed back to Cyrillic, often for political reasons. Some have been recently *reconverted* to Latin a second time, and the newer Latin alphabets are often simplified versions of the former ones, which may now contain fewer or no Cyrillic letters.

Web:	http://www.omniglot.com/writing/azeri.htm
Language:	Azeri or Azerbaijani
Letters:	**Ə ə Ƣ ƣ Ҕ ҕ Ө ө Ƶ ƶ**
Web:	http://www.omniglot.com/writing/chechen.htm
Language:	Chechen
Letters:	**Ə ə Ẋ ẋ** Q q̇ **Ӈ ӈ**
Web:	http://www.omniglot.com/writing/ishkashimi.htm
Language:	Ishkashimi
Letters:	**Ů ů** Ů'ů' **Ҕ ҕ ʏ**

Web:	http://www.omniglot.com/writing/karaim.htm
Language:	Karaim
Letters:	Ƣ ƣ Ь ь Ө ө Ƶ ƶ
Web:	http://www.omniglot.com/writing/ket.htm
Language:	Ket
Letters:	Ә ә Ҕ ҕ Ӈ ӈ Ƶ ƶ Ь ь
Web:	http://www.omniglot.com/writing/khakas.htm
Language:	Khakas
Letters:	Ә ә Ƣ ƣ Ị ị Ṇ ṇ Ө ө Ƶ ƶ Ь ь
Web:	http://www.omniglot.com/writing/kumyk.php
Language:	Kumyk
Letters:	Ƣ ƣ Ӈ ӈ Ө ө Ş ş Ƶ ƶ Ь ь
Web:	http://www.omniglot.com/writing/nenets.htm
Language:	Tundra Nenets
Letters:	Ḃ ḃ Ḍ ḍ Ç ç Ә ә Ӈ ӈ Ь ь
Web:	http://www.omniglot.com/writing/sarikoli.htm
Language:	Sarikoli
Letters:	Ɛ ɛ Ә ә Ы ы З з δ θ X̆ x̆ γ ы' (**ы** with **Acute** added)
Web:	http://www.omniglot.com/writing/talysh.htm
Language:	Talysh
Letters:	Ә ә Ƣ ƣ Ş ş Ƶ ƶ Ь ь İ ı Ğ ğ
Web:	http://www.omniglot.com/writing/tatar.htm
Language:	Tatar
Letters:	Ә ә Ç ç Ƣ ƣ İ ı Ӈ ӈ Ө ө Ş ş Ь ь Ƶ ƶ Ь j
Web:	http://www.omniglot.com/writing/tuvan.php
Language:	Tuvan
Letters:	Ƣ ƣ Ṇ ṇ Ө ө Ş ş Ƶ ƶ Ь ь

See Understanding modifier key notation for an explanation of modifier codes.

Dashes and hyphens

In addition to the standard – hyphen/minus sign and _ underscore, the Q Keyboard supports a number of other minus signs, hyphens, dashes and similar horizontal-line symbols. In this section, the box drawing symbols are not considered hyphens or dashes.

Note: See Quotes and related symbols for **En Dash** and **Em Dash** symbols that are used for quoted text.

Dash/hyphen symbols produced as Live Keys

Live Key	Symbol	U+	Description
AC –	–	2013	En Dash
BU –	-	2011	Non-Breaking Hyphen *
CU –	−	2212	Minus Sign
AC =	—	2014	Em Dash
AB –		00AD	Soft Hyphen (SHY) *
ABC –	⸗	2E40	Double Hyphen
ABC =	‗	2017	Double Low Line

Issues regarding Soft Hyphen (SHY) and Non-Breaking Hyphen

The U+00AD Soft Hyphen and U+2011 Non-Breaking Hyphen (and U+2010 Hyphen, noted below) are not visible in all fonts. The determination as to whether the symbol is seen or not is usually controlled by word-processing software, which may substitute another glyph for this on your screen, such as the common Hyphen-Minus at U+002D. Word processors may use "hyphen" characters as "control codes" and *conditionally* act on these codes, to perform the correct formatting of a document as the context requires.

The Soft Hyphen symbol SHY has a long history of conflicting legacy definitions, depending on where and how it is used. Depending on whether SHY is present in text considered ISO-8859-1, ECMA, HTML or Unicode, SHY may or may not cause, allow or represent a line break; it may or may not be visible; and if visible, it may be represented by a U+002D Hyphen-Minus or some other visible graphic. This is a complex topic. Users interested in more details are advised to do an Internet search on this issue. If you use SHY in your documents, it is important to understand your environment. Otherwise this character may not work as you expect, and in most cases, it will not operate the same way across two different environments.

Some of the dash characters are assigned using a mnemonic approach to help you

remember which key has which symbol, so that an **Em Dash** is on **M**, **En Dash** is on **N**, and so on. These are ***Held Keys***. This follows the mnemonic approach also used in spacing symbols like **Em Space**.

Because hyphens, dashes and similar symbols are simply horizontal lines, a number of different characters may have similar or identical glyphs. One example is Macron vs. Modifier Letter Macron. Use care when typing.

U+2E3A Two-Em Dash and **U+23EB Three-Em Dash** are present in very few fonts. Two that did have them were **Gentium Plus** and **Quivira**.

Dash/hyphen symbols produced as **Dead Keys** and ***Held Keys***

QWERTY Keys		AA Dead Key Symbols				*AA Held Key Symbols*			
LC key	UC key	AL u+	AL sym	AU U+	AU SYM	AL u+	AL sym	AU U+	AU SYM
Dead Key 00 ` ~									
-	_	2212	−						
=	+	2213	∓						
Dead Key 02 2 @									
-	_					02D7	ʒ		
=	+	2E40	⸗			02D6	ꝯ		
m	M	1D6F	ᵐ			2E3A	⸺		
Dead Key 03 3 #									
=	+	203E	‾			2017	‗		
m	M	0270	ɰ			2E3B	⸻		
Dead Key 0B - _									
0	)	2011	NB Hyph			2011	NB Hyph	24EA	⓪
-	_	0332	o̲			0305	o̅	2E17	⸗
=	+	2010	-			2010	-	A78A	
f	F	A799	ꞟ	A798	Ꞟ	2012	–		
h	H	0127	ħ	0126	Ħ	2015	―		
n	N					2013	–		
m	M					2014	―		

Dead Key 0C = +									
9	(					035E	o̅	2472	⑲
0	)	1DCC	ȏ			035F	o̲	2469	⑩
-	_	0335	o̶			0336	o̸		
=	+	0331	o̱			0304	ō	02C9	ˍ

Dead Key 1A [{									
-	_	207B	ˍ			207B	ˍ		
=	+	207C	ˊ	207A	˖	207C	ˊ	207A	˖

Dead Key 1B] }									
-	_	208B	ˍ			208B	ˍ		
=	+	208C	ˊ	208A	˖	208C	ˊ	208A	˖

Dead Key 36 M									
-	_	02ED	ˊ			033F	o̎		
=	+	2017	‗			0333	o̳	0347	o̳

Dead Key 38 . >									
-	_	22EF	···			A719	˙	2238	∸

See Understanding modifier key notation for an explanation of modifier codes.

Dual Diacritic held key guide

The following table shows every **Dual Diacritic** letter assigned to ***Held Keys***. This make it convenient to find these letters all in one place instead of having to search the entire Dead Key Guide to locate them. Characters on the corresponding Dead Keys which are not dual diacritics are grayed-out. Black letters on medium blue background are Vietnamese.

Note that Pinyin script allows two different methods of typing tones on the **ü Ü with Diaeresis**. See the article for more information.

QWERTY Keys		AA Dead Key Symbols				*AA Held Key Symbols*			
LC key	UC key	AL u+	AL sym	AU U+	AU SYM	AL u+	AL sym	AU U+	AU SYM
Dead Key 00 ` ~									
q	Q					1EB1	ằ	1EB0	Ằ
u	U	00F9	ù	00D9	Ù	01DC	ǜ	01DB	Ǜ
f	F	2640	♀			1EC1	ề	1EC0	Ề
g	G	0264	ɤ			1EA7	ầ	1EA6	Ầ
k	K					1ED3	ồ	1ED2	Ồ
v	V	2611	☑			1EEB	ừ	1EEA	Ừ
b	B	2610	☐			1EDD	ờ	1EDC	Ờ
Dead Key 01 1 !									
q	Q					1EB5	ẵ	1EB4	Ẵ
u	U	0169	ũ	0168	Ũ	1E79	ṹ	1E78	Ṹ
o	O	00F5	õ	00D5	Õ	022D	ṏ	022C	Ṏ
f	F	213B	℻			1EC5	ễ	1EC4	Ễ
g	G	02E0	ˠ			1EAB	ẫ	1EAA	Ẫ
k	K					1ED7	ỗ	1ED6	Ỗ
;	:					1E4F	ṏ	1E4E	Ṏ
'	"	2032	′			1E4D	ṍ	1E4C	Ṍ
v	V	1E7D	ṽ	1E7C	Ṽ	1EEF	ữ	1EEE	Ữ
b	B	0183	ƃ	0182	Ƃ	1EE1	ỡ	1EE0	Ỡ
Dead Key 05 5 %									

o	O	01EB	ǫ	01EA	Ǫ	01ED	ǭ	01EC	Ǭ
Dead Key 07 7 &									
q	Q	02A0	ɋ			1EB3	ẳ	1EB2	Ẳ
f	F	AB34	ꬶ			1EC3	ể	1EC2	Ể
g	G	01F5	ǵ	04F4	Ǵ	1EA9	ẩ	1EA8	Ẩ
k	K					1ED5	ổ	1ED4	Ổ
v	V	2C71	ⱱ			1EED	ử	1EEC	Ử
b	B	A797	ꞗ	A796	Ꞗ	1EDF	ở	1EDE	Ở
Dead Key 0C = +									
e	E	0113	ē	0112	Ē	1E15	ề	1E14	Ề
r	R	1E5F	ṛ	1E5E	Ṛ	1E5D	ṝ	1E5C	Ṝ
u	U	016B	ū	016A	Ū	01D6	ǖ	01D5	Ǖ
o	O	014D	ō	014C	Ō	1E51	ồ	1E50	Ồ
l	L	1E3B	ḷ	1E3A	Ḷ	1E39	ḹ	1E38	Ḹ
;	:	2255				1E7B	ṻ	1E7A	Ṻ
Dead Key 1A [{									
u	U	1E77	ṷ	1E76	Ṷ	1E7B	ṻ	1E7A	Ṻ
Dead Key 1B] }									
u	U	01D4	ǔ	01D3	Ǔ	01DA	ǚ	01D9	Ǚ
s	S	0161	š	0160	Š	1E67	ṧ	1E66	Ṧ
Dead Key 1C \ |									
q	Q					1EB7	ặ	1EB6	Ặ
s	S	1E63	ṣ	1E62	Ṣ	1E69	ṩ	1E68	Ṩ
f	F					1EC7	ệ	1EC6	Ệ
g	G					1EAD	ậ	1EAC	Ậ
k	K	1E33	ḳ	1E32	Ḳ	1ED9	ộ	1ED8	Ộ
v	V	1E7F	ṿ	1E7E	Ṿ	1EF1	ự	1EF0	Ự
b	B	1E05	ḅ	1E04	Ḅ	1EE3	ợ	1EE2	Ợ

Dead Key 29 ; :									
`	~	223B	÷			01DC	ǜ	01DB	Ǜ
=	+	2254				01D6	ṻ	01D5	Ṻ
i	I	00EF	ï	00CF	Ï	1E2F	ḯ	1E2E	Ḯ
o	O	00F6	ö	00D6	Ö	022B	ȫ	022A	Ȫ
[	{					01DC	ǜ	01DB	Ǜ
]	}					01DA	ǚ	01D9	Ǚ
a	A	00E4	ä	00C4	Ä	01DF	ǟ	01DE	Ǟ
'	"					01D8	ǘ	01D7	Ǘ
Dead Key 2A ' "									
q	Q	01FD	ǽ	01FC	Ǽ	1EAF	ắ	1EAE	Ắ
e	E	00E9	é	00C9	É	1E17	ḗ	1E16	Ḗ
u	U	00FA	ú	00DA	Ú	01D8	ǘ	01D7	Ǘ
o	O	00F3	ó	00D3	Ó	1E53	ṓ	1E52	Ṓ
a	A	00E1	á	00C1	Á	01FB	ǽ	01FA	Ǽ
s	S	015B	ś	015A	Ś	1E65	ṥ	1E64	Ṥ
f	F					1EBF	ế	1EBE	Ế
g	G	01F5	ǵ	01F4	Ǵ	1EA5	ấ	1EA4	Ấ
k	K	1E31	ḱ	1E30	Ḱ	1ED1	ố	1ED0	Ố
v	V					1EE9	ứ	1EE8	Ứ
b	B					1EDB	ớ	1EDA	Ớ
Dead Key 37 , <									
e	E	0229	ȩ	0228	Ȩ	1E1D	ḝ	1E1C	Ḝ
c	C	00E7	ç	00C7	Ç	1E09	ḉ	1E08	Ḉ
Dead Key 38 . >									
o	O	022F	ȯ	022E	Ȯ	0231	ȱ	0230	Ȱ
a	A	0227	ȧ	0226	Ȧ	01E1	ǡ	01E0	Ǡ
Dead Key 39 / ?									
o	O	00F8	ø	00D8	Ø	01FF	ǿ	01FE	Ǿ

Fractions

The Q Keyboard supports a comprehensive set of precomposed fraction symbols. In addition, by using the superscript and subscript numerics, you can compose any kind of fraction as discrete digits.

Coverage of precomposed fraction symbols varies considerably between one font and the next. Be sure to test the fonts you intend to use. If your fonts do not have explicit bold or italic fraction forms, but you try to apply those attributes anyway in a word processor, they may appear fuzzy. (That is because a word processor may have to **simulate** the effect of bold or italic when a font doesn't actually have it. When it applies that technique to a symbol with fine detail like ⅜ it is hard to do well, and the glyph may end up distorted.)

Most commonly used precomposed fractions can use **AA+BB** and **BB+CC** Live Keys (this is specified as **AB** and **BC** in abbreviated notation), so they are easy and fast to type:

Live Key	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
AB+Key	½	⅓	¼	⅕	⅙	⅖	⅛	⅜
BC+Key	½	⅔	¾	⅘	⅚	⅗	⅞	⅝

The characters in blue above have been assigned to key locations in a logical pattern according to the following rules, to help you remember which key has which fraction:

- For **AB+*key***, the fractions have a numerator of **1**, and a denominator equal to the key they are on. So, for key **4**, **AB 4** is ¼
- For **BC+*key***, the fractions have a numerator equal to the key before it, and a denominator equal to the key they are on. So, for key **4**, the key before it is **3**, and thus **BC 4** is ¾
- For key **2**, since both rules imply the fraction ½ you are able to produce it using either **AB 2** or **BC 2**. This allows the rules above to be applied consistently for key **2**.
- The precomposed fractions 1/7 and 1/9 are missing in many fonts. Instead, **keys 7 and 9** are used to fill in the extra fractions of ⅖ ⅗ ⅜ and ⅝ that are not accounted for by the first two rules.

Typing fraction forms as Held Keys

The Q Keyboard allows you to "compose" the predefined fractions using the ***Held Keys AA 1*** through ***AA 5*** and ***AA 7*** • This may be helpful if you type fractions only occasionally,

since this technique is very intuitive and easy to remember. To emphasize that these are **lower-case** Held Keys (not using Shift) ***AA*** is shown as ***AL*** below.

Some of these fraction forms are infrequently implemented. Where a symbol is **less likely to exist** in your font, these are marked in **blue**. Be sure to confirm they are present if you plan to use them. The font used below is DejaVu Sans, one that happens to define all of these symbols.

Notice how the keys typed after ***AL*** remind you of the symbol itself. For instance, ***AL 3 4*** reminds you of ¾. Like all Held Keys, hold down the ***AA*** modifier key until the sequence is completed.

> Note: You may find the ***Held Key*** forms of fractions are ***so*** easy to remember, you may use them all the time, instead of the **Live Key** fractions, even though Live Keys are slightly faster. To the author's knowledge, no other keyboard has a fraction composition facility this easy to remember.

Held Key	Symbol	Description
AL 0 3	⁰⁄₃	**Vulgar Fraction Zero Thirds**
AL 1 2	¹⁄₂	**Vulgar Fraction One Half**
AL 1 3	¹⁄₃	**Vulgar Fraction One Third**
AL 1 4	¹⁄₄	**Vulgar Fraction One Fourth**
AL 1 5	¹⁄₅	**Vulgar Fraction One Fifth**
AL 1 6	¹⁄₆	**Vulgar Fraction One Sixth**
AL 1 7	¹⁄₇	**Vulgar Fraction One Seventh**
AL 1 8	¹⁄₈	**Vulgar Fraction One Eighth**
AL 1 9	¹⁄₉	**Vulgar Fraction One Ninth**
AL 1 0	¹⁄₁₀	**Vulgar Fraction One Tenth**
AL 1 /	¹⁄	**Fraction Numerator One**
AL 2 3	²⁄₃	**Vulgar Fraction Two Thirds**
AL 2 5	²⁄₅	**Vulgar Fraction Two Fifths**
AL 3 4	³⁄₄	**Vulgar Fraction Three Fourths**
AL 3 5	³⁄₅	**Vulgar Fraction Three Fifths**
AL 3 8	³⁄₈	**Vulgar Fraction Three Eights**

AL 4 5	4⁄5	**Vulgar Fraction Four Fifths**
AL 5 6	5⁄6	**Vulgar Fraction Five Sixths**
AL 5 8	5⁄8	**Vulgar Fraction Five Eights**
AL 7 8	7⁄8	**Vulgar Fraction Five Eights**

Example: Type the **2/3** fraction as a ***Held Key***

- press and **continue to hold** the **AA** modifier key
- type **2**
- type **3**; the ⅔ fraction appears
- release the **AA** key

Composing fractions

By using the superscript and subscript numerics, and the **Fraction Slash** character, you can compose any desired fraction. The ⁄ Fraction Slash has a different angle than a **/** regular slash does in most fonts, which should make for a more attractive appearance when composing fractions. The "font attributes" for this symbol may also incorporate "kerning" so that it fits more closely to the numerator and denominator digits, making it a better choice to use than a regular slash.

You may find that the ⅟ symbol **Fraction Numerator One** noted above can be combined with subscript digits if your numerator is 1, depending on the font in use. If you do that, you won't need the Fraction Slash. You will need to test this to be sure its alignment and spacing suit your needs.

Note that the Fraction Slash is on both **AA [/** and **AA] /** so you can use either one that is convenient. When composing fractions, it may be easier to type them as ***Held Keys***, so that the **AA** key need not be pressed and released over and over.

Example: Compose the fraction **23/45**

Type the following in order:

1. Hold **AA**
2. Press in order: **[2 [3 [/] 4] 5**
3. Release **AA**

Result:

$^{23}/_{45}$

See Understanding modifier key notation for an explanation of modifier codes.

Glottal, click and special symbols

A number of alphabets, such as those for African languages and those devised for indigenous peoples, have taken various phonetic pronunciation symbols and integrated them into their languages. Thus, these symbols are no longer used just by linguists and scholars but are seen in everyday words.

The Q Keyboard supports the pronunciation symbols you are most likely to encounter.

The most commonly used glottal stop symbol **ʔ** is available as a **Live Key** on **BL /** • This makes it easier and faster to type this symbol, which is used more than all other stop symbols combined. The **ʔ** symbol is on the **/?** key because of the similarity of **ʔ** to a **?** question mark.

> Some languages for indigenous peoples (such as those in Canada) had a glottal stop symbol **ʔ** in their alphabet, but in the days of typewriters not having this symbol, they substituted the digit **7** for this. Having a technology like the Q Keyboard might encourage such people to use the **ʔ** symbol instead.

The modifier letter triangular colon symbol ˑ often appearing after vowels is available as a **Live Key** on **AC :** as well as on **Dead Key AL X :** • A similar **half**-triangular colon ˓ is on **Dead Key AL X '**

> For a complete list of supported IPA symbols, see Phonetic symbols.

The remaining symbols are produced as **AL Dead Key** letters, while a few lesser-used ones are ***AL Held Keys***.

Notice how the glottal symbols that look similar to **?** question-mark are "paired" so that the ***Held Key*** versions have a horizontal stroke, while **AL Dead Key** ones do not. The symbols on the **/?** key are handled as if they were letters; the shorter "lower case" **ʔ** symbol is a Dead Key, and the larger "upper case" **ʔ** symbol is a ***Held Key***.

An attempt was made to place these symbols on keys that would help you remember them:

- the symbols **ˀ** and **ˁ** are on **[** and **]** as a matched set, with similar "curvatures"
- the symbols **ʕ ʕ** and **ʔ ʔ** are on **<** and **>** as matched sets, again with similar "curvatures"
- the symbols **ɔ ʔ** are on the key with the similar-looking **?** question-mark punctuation
- the inverted glottal symbols **ʖ ʢ** which somewhat resemble a digit **5** with the top bar

removed are on key **5**

- the "click" symbols **! ǂ | ǁ** and Modifier Colons ˑ ˑ are on keys **! = | / :** and **'** that should be easy to remember and type

- The "**Saltillo**" symbols are quotation-like marks used as glottal stop indicators for some languages in Mexico and in Central and South America. Other places the Saltillo mark is reportedly used are Southeast Asia, the Philippines and Malaysia. A Wikipedia article on these symbols can be found here.

In addition to, or instead of what appears below, some languages use apostrophes or quotation-like symbols instead of glottal symbols. Polynesian languages are in that category. See the section Quotes and related symbols to see what symbols are available.

None of the symbols below use the Shift key. The choice of which character to show under the "Key" heading is based on which is easier to remember. That is simply a documentation convention, to help explain these concepts. **Do not use Shift**.

Note that **U+02C1** Modifier Letter Reversed Glottal Stop and **U+02E4** Modifier Letter ***Small*** Reversed Glottal Stop may be difficult to distinguish in many fonts, in addition to having very similar names.

Live Key, **Dead Key** or ***Held Key***	**Symbol**	**U+**	**Description**
BL /	ʔ	**0294**	**Latin Letter Glottal Stop**
AC :	ˑ	**02D0**	**Modifier Letter Triangular Colon ǂ**
AL 9 0	ʘ	**0298**	**Latin Letter Bilabial Click**
AL 9 [	ɬ	**02AD**	**Latin Letter Bidental Percussive**
AL 9 W	ʬ	**02AC**	**Latin Letter Bilabial Percussive**
AL 9 [	ˁ	**02C1**	**Modifier Letter Reversed Glottal Stop**
AL 9]	ˀ	**02C0**	**Modifier Letter Glottal Stop**
**AL 9 **	˄	**02E4**	**Modifier Letter *Small* Reversed Glottal Stop**
AL 9 5	ʖ	**0296**	**Latin Letter Inverted Glottal Stop**
AL 9 5	ƾ	**01BE**	**Latin Letter Inverted Glottal Stop With Stroke**
AL 9 <	ʕ	**0295**	**Latin Letter Pharyngeal Voiced Fricative**

AL 9 <	ʕ̶	02A2	Latin Letter Reversed Glottal Stop With Stroke
AL 9 >	ʔ	0294	Latin Letter Glottal Stop
AL 9 >	ʔ̶	02A1	Latin Letter Glottal Stop With Stroke
AL 9 ?	ʔ	0242	Latin Small Letter Glottal Stop
AL 9 ?	ʔ	0241	Latin Capital Letter Glottal Stop
AL X !	ǃ	01C3	Latin Letter Retroflex Click *
AL X =	ǂ	01C2	Latin Letter Alveolar Click †
AL X |	ǀ	01C0	Latin Letter Dental Click
AL X /	ǁ	01C1	Latin Letter Lateral Click
AL X :	ˑ	02D0	Modifier Letter Triangular Colon ‡
AL X '	˓	02D1	Modifier Letter Half Triangular Colon
AL M :	꞉	A789	Modifier Letter Colon ‡
AL ^ :	˸	02F8	Modifier Letter Raised Colon ‡
AL ' [	ꞌ	A78C	Latin Small Letter Saltillo
AL ' [	ꞌ	A78C	Latin Small Letter Saltillo
AL ']	ꞎ	A78B	Latin Capital Letter Saltillo
AL ']	ꞎ	A78B	Latin Capital Letter Saltillo

* Depending on the font in use, the Retroflex Click symbol ǃ may or may not appear different than the standard ASCII exclamation point.

† Some linguists have used a **Not Equal** math symbol ≠ to represent an ǂ Alveolar Click. The Not Equal symbol is available on **Live Key BU =** • It is also possible to use the similar **Double Dagger** symbol ‡ on **Live Key AC 2** • A true Alveolar Click symbol is preferable when present in the font being used.

‡ Depending on the font in use, these Modifier Colon symbols may or may not appear different than the standard ASCII colon.

Note: There are symbols on **AL 6** for **Raised Dot** and **Raised Comma** that are neither Modifier Letters nor click symbols, but may be used that way. See Key 06: Circumflex and Cyrillic for more information.

See Understanding modifier key notation for an explanation of modifier codes.

Greek letters

The Q Keyboard allows you to type Greek letters. This includes the 24 standard letters of the Greek alphabet, and the accented letters of modern Greek, known as Monotonic Accents. Some letters adapted from Greek into Latin scripts are available, such as Latin Beta, which is different than Greek Beta. You can also type selected Greek symbols which are variations on Greek letters, such as **ϱ Greek Rho Symbol**, as compared to **ρ Greek Small Letter Rho**. Some letters considered "Greek" are not supported because they are Greek ligatures, which are too specialized to be included. One ligature that is supported is the commonly used **Kai** symbol **ϰ** which is Greek for "AND". This appears on ***Held AL 4 7***, where the **&** symbol is located on key 7.

> The symbol **ƛ U+019B Latin Small Letter Lambda with Stroke** is used in a number of indigenous languages. See Apache and indigenous languages for more information. Note that this **Latin** letter is spelled as **Lambda** in Unicode, whereas the **Greek** letter **Λ λ** is spelled as **Lamda** without a **B**. There is no capital form of this letter.
>
> There are also four Greek-like math symbols on Live Key **M**. These are discussed below.

Most Greek letters are typed as **Dead Keys**. To produce a basic Greek letter, hold the **AA** key and press the **4** key. For upper-case letters, hold **AA**+Shift and press the **4** key. Then, release **AA** and type the final letter as shown below. For example, **AL 4 B** will produce a lower case **β** Beta.

You can type capital Greek letters using Early Shift or Late Shift, whichever you prefer. See Capitalization rules for more information. As with other Dead Keys on the Q Keyboard, Greek Dead Key letters respect the state of Caps Lock. The special Greek symbols and Greek-like letters such as **ƛ** are typed as ***Held Keys*** which do not respect Caps Lock.

Consult the Dead Key Guide for Greek to see a complete list of the Greek letters you can type.

> Every Greek letter must be typed as a Dead Key or Held Key, and because that requires more effort than using Live Keys, the Q Keyboard is not intended as a replacement for native Greek keyboards. The primary purpose of Greek support on the Q Keyboard is for typing short passages, proper names, geographic locations, and so on. There are also some Latin languages that require a few Greek letters.
>
> This feature can also be used for inserting Greek symbols into math formulas, such as **A = π r ²**.

Unicode has certain Greek-specific punctuation. The Q Keyboard does not support them, because Q keyboard is not intended to replace native Greek keyboards. Since these characters resemble others which **are** available, you can make appropriate substitutions.

Sym	U+	Greek Punctuation	Substitute with	Sym	U+	On key
·	0387	**Ano Teleia**	Middle Dot	·	00B7	CL –
ʹ	0384	**Tonos**	Acute Accent	´	00B4	AC `
ʹ	0374	**Numeral Sign**	Vertical Line Above	ˈ	02C8	**Dead AL – ;**
͵	0375	**Lower Numeral Sign**	Vertical Line Below	ˌ	02CC	***Held AL – ;***
;	037E	**Question Mark**	Semicolon	;	003B	;

In addition to what appears above, you could use the ´ symbol on **Dead AL / 8** and the ˏ symbol on ***Held AL / 8*** as substitutes for the Numeral Signs.

Here is a diagram showing how Greek letters are assigned to the standard keys of the QWERTY keyboard, to help you visualize their locations.

> A hardware-defined Q Keyboard would not show all of these Greek letters as keycap legends, due to lack of space. Hardware-defined keyboards do not as yet exist.

The special letters on the numeric row in **red** with a yellow background are to remind you of their key locations in the diagram. This is just a notational convention to explain these letters, and was done this way so the diagram would not get overly complicated. These symbols do not actually replace any regular QWERTY digits or punctuation. For instance, **AL 4 8** has **ϖ** U+2C77 Latin Small Letter Tailless Phi, while the regular key **8** still has digit **8** as usual. See the Greek Dead Key guide for more information.

Notice the red **Δ** Delta on the **4** key; that shows it is the **Dead Key** for Greek. The actual **letter Δ** Delta is on **D**, not on the **4** key. The location where each Greek letter is assigned to a particular Latin key generally conforms to contemporary Greek keyboard designs, except that lower case **ς** final Sigma is on ***Held Key AL 4 S*** rather than being on the **W** key. This was done to take advantage of the Q Keyboard's Held Key feature and to help make the final Sigma easier to remember. Typists who are at all familiar with the Greek alphabet should recognize the Greek-to-Latin associations for each key, since nearly all are related either visually or phonetically.

For the non-QWERTY layout variants, the Greek letters follow the relocated QWERTY keys. So, for instance, on an AZERTY variant, Greek Alpha **α** would be on the AZERTY's Logical **A**

key, which is the QWERTY's Physical **Q** key.

The Theta *Symbol* on **Q** was added so that the Greek Dead Key for **Q** would not be unoccupied, and because **Q** somewhat resembles Theta. The letter on **W** is a Latin Omega, not a Greek Omega; it is available in few fonts. According to Wikipedia, the Theta *Symbol* may be used (as opposed to the *letter* Theta) for technical and mathematical purposes.

> The letter Upsilon could be confusing for those not familiar with Greek. Lower-case Upsilon is **υ** and upper case is **Y** and are produced by the QWERTY **Y** key, while the QWERTY **U** key is for **θ** and **Θ**. Also, the **W**-like letter **ω** Omega is not on **W** but on **V**, and so on. These conform to contemporary Greek keyboard key assignments, and may take some getting used to.

Greek accents

Prior to recent reforms, traditional Greek historically had a complex system of diacritics, called the Polytonic Orthography. This was greatly simplified in modern Greek, which now has a Monotonic Orthography. The new system uses just three marks, which are the Acute accent, the Diaeresis, and a mark that combines an Acute and Diaeresis together. The Acute-like symbol is called **Tonos**, the Diaeresis-like symbol is called **Dialytika**, and the combined symbol is a **Dialytika Tonos**, rather than having a unique name of its own. Accents are only applied to vowels. (Remember that **Eta η H** and **Omega ω Ω** are vowels.)

The Q Keyboard allows you to produce precomposed Greek vowels with their Monotonic accents. When you do this, an accented Greek letter must be typed as a ***Held Key*** rather than as a **Dead Key**.

> **Note**: The Unicode standard describes a large number of accented Greek letters, as well as Greek combining modifier marks, that are part of the Polytonic Orthography. Examples are **U+1F04 Greek Small Letter Alpha with Psili and Oxia** and **U+1FDD Greek Dasia and Varia**. The Q Keyboard does not support these extra symbols, except for a tiny number that are occasionally used by linguists. See Combining Diacritics Complete List for the available Greek accents.
>
> To put the complexity of the Polytonic Orthography in perspective, the standard Microsoft Windows keyboard layout requires **34** dead keys for Polytonic Greek. The total count of "Greek" symbols in Unicode, most of which are Polytonic letters, is **374**. *That is a lot*. Other than basic punctuation and the special Greek symbols noted above, this keyboard can type nothing else, not even Latin letters. Native Greek speakers requiring such complex, Greek-specific features should use a native keyboard, not the Q Keyboard.

Most Monotonic vowels only take a Tonos (acute) accent. The letters **Y** (Upsilon) and **I** (Iota) can also take the Dialytika (diaeresis) and Dialytika Tonos. However, the combined **Dialytika Tonos** is only used on **lower-case** Upsilon and Iota. If you try to produce an

upper-case Upsilon or Iota with Dialytika Tonos, you will get incorrect results.

If you try to manually add Dialytika Tonos to Upsilon and Iota, you may find that it doesn't work well, or maybe not at all. If you had a need to do this anyway, you might try substituting **Latin Y** and **Latin I** and adding the Dialytika Tonos to them, or adding Dialytika and Tonos (Diaeresis and Acute accents) separately. Testing suggests these might work better.

As with other diacritics on the keyboard, it is possible to manually add Greek monotonic accents to Greek letters*.

For the Tonos (acute) and Dialytika (diaeresis) accents, **there are no specific Greek Unicode symbols**. You would type ***AL* ' '** for the Tonos (acute) combining symbol, and type ***AL* ; ;** for the Dialytika (diaeresis) combining symbol. That is, just use ordinary **Acute** and **Diaeresis** accents.

There is a Unicode symbol at **U+0385** for the combined Dialytika Tonos, which you obtain by typing ***AL 4 4*** • For these combining symbols, you must hold ***AA*** while typing the indicated key **twice**. The notation ***AL 4 4*** is used to emphasize that Shift is not being used.

Don't hold the Shift key when typing any of these combining symbols, or else you will get incorrect results. ***AA+Shift 4 4*** does not contain an accent, but is undefined. (The usual notation for ***AA+Shift 4 4*** is ***AU 4 4***.) If you type this, you will get ΔΔ instead.

* As with other combining symbols, you could generally add a Dialytika Tonos to any letter you wished (for instance, you would get **s̈** by adding it to Latin letter **s**) if your font allows this, not just to Greek letters. There just wouldn't be much demand for it.

Typing accented Upsilon and Iota letters

Because **Y** Upsilon and **I** Iota can appear in four different forms (plain or with one of the three accent types), it poses a problem as to assigning key locations for them. Techniques used elsewhere on the Q Keyboard, such as the "southwest vowels" and "northwest vowels" would not be enough, since there are **three** added accented forms to contend with, not just **two**. The letters could have been placed on random, unrelated keys, but then the locations would have been inconsistent and hard to remember.

Instead, the Q Keyboard "borrows" the Dead Keys on **5** and **6** for these additional letters; those keys are ordinarily used for Ogonek and Circumflex letters, respectively. All of the Greek accents are produced as Held Keys, so this approach does not conflict with the standard uses of keys **5** and **6**.

The following table shows how to type all of the forms of Upsilon and Iota. Standard Capitalization rules apply. Note how the Dialytika Tonos has no upper case forms.

Letter	Accent Type	Type as	Key	Sym	Key	Sym
Upsilon	Unaccented	Dead Key	AL 4 Y	υ	AU 4 Y	Υ
	Tonos (acute)	*Held Key*	*AL 4 Y*	ύ	*AU 4 Y*	Ύ
	Dialytika (diaeresis)	*Held Key*	*AL 5 Y*	ϋ	*AU 5 Y*	Ϋ
	Dialytika Tonos	*Held Key*	*AL 6 Y*	ΰ	*AU 6 Y*	---
Iota	Unaccented	Dead Key	AL 4 I	ι	AU 4 I	Ι
	Tonos (acute)	*Held Key*	*AL 4 I*	ί	*AU 4 I*	Ί
	Dialytika (diaeresis)	*Held Key*	*AL 5 I*	ϊ	*AU 5 I*	Ϊ
	Dialytika Tonos	*Held Key*	*AL 6 I*	ΐ	*AU 6 I*	---

Greek-like math symbols

In addition to true Greek letters, there are a few Greek-like Unicode math symbols that are available as **Live Keys** and **Dead Keys**. These look similar to certain upper-case Greek letters, but are sometimes rendered in a slightly larger size. These characters are made available for compatibility with other international keyboards. The character most likely of interest among these is the **µ Micro** symbol, as it is used for quantities in the Metric System, and somewhat less often the **Ω Ohm** symbol (a measure of electrical resistance). Depending on the font used, the Micro symbol **µ** and the Ohm symbol **Ω** may appear very similar or identical to lower-case Mu **µ** and upper-case Omega **Ω**, respectively.

The reason there are redundant **Dead Key** definitions for these symbols is in case the **Live Keys CC M** and **BB M** might be needed in the future for other purposes, or for possible new regional layout variants. If that happened, the assignments on key M might be changed, perhaps to certain accented forms of M or N that don't presently have Live Keys for them, such as letters with Acute, Grave, Dot Above or Below, or Diaeresis. There are no specific plans to do this, but the current arrangement allows some "elbow room" to alter the design if the need ever arose.

Most users will find the **Live Key** symbols easier to type. For the symbols on Dead Keys, be careful **not** to type them as ***Held Keys***, or else modifier letters will appear instead of the math symbols below. You can remember the Dead Key math symbols by the acronym SOUP.

Live Key	Dead Key	Symbol	Description
BL M	AL M S	∑	Summation symbol
CU M	AL M O	Ω	Ohm symbol

CL M	**AL M U**	**μ**	**Micro symbol**
BU M	**AL M P**	**∏**	**Product symbol**

Note: A Wikipedia diagram for the Canadian Multilingual keyboard shows misleading symbols for Greek letters **Ω** and **ω**. See the Help article about this keyboard for more information.

For **∑**-like summation symbols and similar constructs that span multiple lines, see Multi-Line Bracketing and Math symbols.

See Understanding modifier key notation for an explanation of modifier codes.

Hyper keys

The Q Keyboard has a feature you are unlikely to find on any other keyboard, which is the presence of **Hyper Keys**. A Hyper Key is a specialized type of Live Key. Like other Live Keys, Hyper Keys do not respect Caps Lock.

> A hardware-defined Q Keyboard would never use exotic names like "Hyper", "Super" or "Meta" on the legends of its key caps, since these terms and concepts are often difficult to translate into non-English languages. Rather, the term "Hyper Key" is only used within this documentation to explain the special combined use of the modifier keys AA, BB and CC. In a translation of this documentation, "Hyper Keys" might become the equivalent of "Extended Modifiers", "Modifier Chords" or "Triple Modifiers".
>
> There is no real relationship between the **Hyper Keys** on the Q Keyboard and "hyper key" modifiers that have been present on various high-technology keyboards in the past.

You are said to be typing with a **Hyper Key** when you are doing one of the following:

- holding down the **AA**, **BB** and **CC** modifiers at the same time while typing a letter
- holding down the **BB**, **CC** and Shift modifiers at the same time while typing a letter

When you use the **BB**, **CC** and Shift modifiers at the same time, this can be called a Hyper Shift Key, or just a Hyper Shift, to distinguish it from the Hyper Key form that **doesn't** use Shift. The documentation does not dwell on this term, and it's not overly important, but you may find it useful to refer to it that way.

To keep these notations brief, **AA+BB+CC** is shown as **ABC** in the documentation, and **BB+CC**+Shift is shown as **BCU**. There is additional information on this in the article Live Key Chords.

> Technically, when using a **BCU** Hyper Shift, either Shift key could be pressed. In practice, it would be quite difficult to hold **BB+CC** on one side of the keyboard and the Shift from the other side while **then** typing the final key (and, no real need to). Most people wouldn't be able to do that.

Why do Hyper Keys exist? They provide an additional means to type characters quickly, like other Live Keys, **but are intended for symbols you don't need very often**. That last part is important, because holding down three modifier keys takes more effort, so it's not something you'd want to do all the time.

The symbols assigned to these keys were carefully considered, to be useful symbols you'd only use occasionally. Some of them can be typed other ways, such as by using a Dead Key or a combining modifier, so if you prefer not to use Hyper Keys, there are usually other ways to obtain the same results.

Hyper Keys are used to produce the following kinds of symbols, which are discussed below:

- Letters with Macron or Macron Below added as Combining Modifiers
- Special-purpose letters with accents, also added as Combining Modifiers
- Math symbols
- Musical notation
- Various punctuation marks
- The Q Keyboard ID string

In the tables below, the **U+** column is omitted when Combining Modifiers are involved, since these are not individual characters. The U+ value is shown on the punctuation symbols that are single characters.

Letters with Macron or Macron Below added as Combining Modifiers

Unicode defines a number of letters with either a **Macron** or **Line Below** as precomposed symbols. Macron **vowels** can be typed as Northwest Vowel keys. Other letters with Macron or Line Below use the Dead Key for that purpose on **AA =+** • When Unicode defines a letter as using one of these marks, it never defines the same letter with the **other** mark. So, there is a predefined **ā** with Macron, but no predefined **A with Line Below**. The Hyper Keys are used to "fill in the gaps" to give you the "opposite" letter from the one ordinarily available by the means discussed above.

• The naming conventions in Unicode for an underscore-like mark "below" a letter are ambiguous. For instance, letter **Ḏ** is called **U+1E0E Latin Capital Letter D With Line Below**. However, if a combining "line below" mark is added to D it looks like **D̲** where the mark is much wider. This can be a problem. If several such letters are next to each other, the line marks can sometimes merge together, as if an "underline" attribute had been added by a word processor. To avoid that, the "below" marks added by Hyper Keys are always **U+0331 Combining Macron Below** and not the wider **U+0332 Combining Low Line**.

• In nearly all fonts, if you attempt to add a Macron Below or Line Below to a lower-case letter with a descender, such as lower-case **p**, the added mark will get truncated or disappear. Because of this problem, the rules for these Hyper Key marks avoid putting a line below a descender.

• One of the reasons for making this underlining feature available is that in a number of indigenous languages, there is a tendency to use letters with a line below. Hyper Key underlining is an attempt to make typing of those languages a little easier. Feedback from users of such alphabets would be helpful and appreciated.

The rules for Hyper Key underlining of **A** to **Z** are as follows, taking these facts into account:

- putting a Macron (above) on A-Z will always be successful, without truncation occurring
- putting a Macron Below on **capital** A-Z will always be successful, since capitals have no descenders

1. If a precomposed letter with Line Below exists, the corresponding Hyper Key produces a letter with a combining Macron (above).

2. If a precomposed letter with Macron (above) exists, then:
- the upper-case letter gets Macron Below
- if the lower-case letter has a descender, that letter gets Macron (above)
- if the lower-case letter does not have a descender, that letter gets Macron Below

3. If no precomposed letter with either Macron or Line Below exists, then:
- if the lower-case letter has a descender, the both upper-case and lower-case letters get Macron (above)
- if the lower-case letter does not have a descender, the both upper-case and lower-case letters get Macron Below

4. Letter **H** is a special case. Unicode defines lower-case **ẖ with Line Below** but there is no upper case form. To correct this shortcoming, **Hyper Key H** adds Macron Below to both **h** and **H** as combining modifiers, to complete the definition of **H**. That way, you can use letter **H** consistently.

> In Q Keyboard terminology, the letter **H** is ***defective*** with respect to the **Line Below** accent, since a precomposed letter is available in lower-case, but not in upper-case. On the Macron dead key, this is compensated for by placing a plain **H** in the upper-case position. For the **Hyper Key** assignment of **H** we can do better, and actually add a **Macron Below** as needed.

5. Letter **F** has no precomposed Macron or Line Below forms, so it *should* get Macron Below if rule 3 were followed. However, because of its shape, placing a Macron Below under an **F** makes it appear too much like the letter **E**, which would be confusing. (The same problem exists to a lesser extent for lower-case **f** also.) To avoid that, letter **F** gets Macron (above) added instead.

The rules are designed to create the most useful and readable letters.

> **Note**: Some indigenous languages have orthographies that insist upon a **Macron Below** or **Line Below** being applied to letters with **descenders**, such as lower case **g**, even though this gets truncated in many fonts. If you need to type such letters, you will have to apply a combining Macron Below or Line Below manually instead of using a Hyper Key, and then carefully choose a font where truncation does not occur. The font **Gentium Plus** often works well in this regard where others do not.

Because these letters will have combining diacritics, to remove one you would have to use a Delete or Backspace key **twice**, once for the plain letter and once for the accent.

Here is a summary of the Hyper Key letters you will see, following the rules noted above:

a̱	A̱
ḇ	Ḇ
c̱	C̱
ḏ	Ḏ
e̱	E̱
f̱	F̱
g̱	G̱
ẖ	H̱
i̱	I̱
j̱	J̱
ḵ	Ḵ
ḻ	Ḻ
m̱	M̱
ṉ	Ṉ
o̱	O̱
p̱	P̱
q̱	Q̱
ṟ	Ṟ
s̱	S̱
ṯ	Ṯ
u̱	U̱
v̱	V̱
w̱	W̱
x̱	X̱
y̱	Y̱
ẕ	Ẕ

See also the Live Key QWERTY diagram and the Live Key List for complete information on what is available.

When you use Hyper Keys to type a letter with a Macron Below, that mark is added on a letter-by-letter basis, so it may not line up vertically if applied to several letters in a row. **This is not going to look like "underlining" in a word processor**. If that is an issue for you, you could actually **use** underlining, if your document is in a word processor like Microsoft Word.

If you want to manually add Macrons and Low Lines to symbols, here is what you need to

know:

- U+0304 on ***AL = =*** is the Combining Macron (above)
- U+0331 on ***AL = –*** is the Combining Macron Below
- U+0305 on **AL = =** is the Combining Overline, which is wider than the Combining Macron
- U+0332 on **AL = –** is the Combining Low Line, which is wider than the Combining Macron Below

The wider marks are not used by Hyper Keys, but you are free to add them yourself.

You will need to validate your font, both to confirm that these modifiers are present, and to make sure they have the width you need. A few fonts have been found that *reverse* the relative widths of the Macron Below and Low Line, so don't just assume that your font does it correctly. You will have to check.

As with other combining modifiers, these may or may not compose correctly, even in this Help document. To address that, the specific kind of line is included at every point in the following example, just to be clear, even though it's a very redundant explanation.

Example: Letter **ē Ē** with Macron Above is precomposed, but we want to type **e̱ E̱** with Macron Below

- Holding **ABC**, press **E** • **e̱** with Macron Below appears. Release **ABC**.
- Holding **BCU**, press **E** • **E̱** with Macron Below appears. Release **BCU**.

Example: Letter **r̲ R̲** with Macron Below is precomposed, but we want to type **r̄ R̄** with Macron Above

- Holding **ABC**, press **R** • **r̄** appears with Macron. Release **ABC**.
- Holding **BCU**, press **R** • **R̄** appears with Macron. Release **BCU**.

Example: Letter **w W** has no precomposed forms with macron or line below.
We want to type both **w̲ W̲** with Macron Below and **w̄ W̄** with Macron Above.

For **w̲ W̲**:

- Holding **ABC**, press **W** • **w̲** with Macron Below appears. Release **ABC**.
- Holding **BCU**, press **W** • **W̲** with Macron Below appears. Release **BCU**.

For **w̄ W̄**:

- Type **w** followed by ***AL = –*** • **w̄** with Macron appears.
- Type **W** followed by ***AL = –*** • **W̄** with Macron appears.

<u>Special-purpose letters with accents, also added as Combining Modifiers</u>

These Hyper Key letters are provided primarily to support African scripts.

Key	Symbol	Key	Symbol	Description
ABC `	ɛ̃	**BCU `**	ɛ	**Open E with Tilde**
ABC 1	ɔ̃	**BCU 1**	ɔ	**Open O with Tilde**
ABC 9	ɛ̈	**BCU 9**	ɛ	**Open E with Diaeresis**
ABC 0	ɔ̈	**BCU 0**	ɔ	**Open O with Diaeresis**
ABC :	n̈	**BCU 0**	N̈	**N with Diaeresis**

Math symbols

Key	Symbol	U+	Key	Symbol	U+	Description
ABC 2	∀	**2200**				**For All**
ABC 3	∃	**2203**				**There Exists**
ABC 4	⌠	**2320**				**Integral top half**
ABC 5	⌡	**2321**				**Integral bottom half**
ABC 6	∪	**222A**				**Union**
ABC 7	∩	**2229**				**Intersection**
ABC 8	∝	**221D**				**Proportional To**
			BCU –	⊕	**2295**	**Circle + or Exclusive Or**
ABC <	⋘	**22D8**				**Very Much Less Than**
ABC >	⋙	**22D9**				**Very Much Greater Than**
			BCU <	∧	**2227**	**Logical And**
			BCU >	∨	**2228**	**Logical Or**
ABC /	∫	**2202**				**Integral**
			BCU /	∂	**2202**	**Partial Differential**

Musical notation

In addition to the musical Eighth Note ♪ on **AC M** the following are available as Hyper Keys. You might observe certain features about these symbols to help you remember them:

- The Fourth Note ♩ is on 4
- The Eighth Note ♪ is on 8
- The Sharp ♯ is on the key with #
- The similar-looking Natural sign ♮ is on 2, just left of the #
- The Flat ♭ is on 6, which it somewhat resembles

Key	Symbol	U+	Description

BCU 2	♮	266E	Natural
BCU 3	♯	266F	Sharp
BCU 4	♩	2669	Fourth note
BCU 5	♬	266C	Beamed Sixteenth notes
BCU 6	♭	266D	Flat
BCU 7	♫	266B	Beamed Eighth notes
BCU 8	♪	266A	Eighth note

Various punctuation marks

The trigraph composition of **CopyLeft** is present to address planned usage on French AFNOR keyboards. The symbol shown below as **black on yellow background** is an approximation. Copyleft, with a Unicode value of U+1F12F, became part of the Unicode version 11 standard in June 2018. Presently, U+1F12F is the only character on the keyboard that is outside the Unicode Basic Mapping Plane (BMP). This key will produce the correct Unicode code point, but there are few fonts that implement this symbol. Fonts are revised all the time, so you should check with your font vendor to see if support has been added. **Update**: As of February 2019, the most recent Roman Cyrillic Std font supports CopyLeft.

Key	Symbol	U+	Key	Symbol	U+	Description
ABC –	⸗	2E40				Double Hyphen
ABC =	‗	2017				Double Low Line
ABC [	′	2032	BCU [	‵	2035	Prime and Reverse Prime
ABC]	″	2033	BCU]	‶	2036	Double Prime and Reverse Double Prime
ABC \	‴	2034	BCU \	‷	2037	Triple Prime and Reverse Triple Prime
ABC '	(ɔ)	---				Trigraph of CopyLeft symbol
			BCU '	(ɔ)	1F12F	New CopyLeft symbol

The Q Keyboard ID string

When you type the Hyper Key **BCU =** a string will appear that defines the variant layout type of your Q Keyboard.

This will only work with the modifier keys currently defined as **BB** and **CC** at the time. Current implementations of the Q Keyboard locate **BB** and **CC** on the **left** Windows Logo key and the **left** Ctrl key, respectively. So, if you intended to type **BCU** but used the regular keys on the right side of the keyboard, those will be the ordinary **Ctrl**, **Windows Logo** and Shift keys, and if you hold them and type the **=** key, nothing will happen.

For a hardware-defined keyboard, these inconsistencies would not occur, since dedicated **AA**, **BB** and **CC** keys would be present. However, since a hardware-defined keyboard would only behave in one way, it is possible that it would not even implement an ID string, since it would not generally be needed. This issue is to be determined.

The string that is produced comes out in the form of a digraph or trigraph.

See Understanding modifier key notation for an explanation of modifier codes.

Math symbol dead key guide

The follow table shows every Math symbol available as **Dead Keys** and ***Held Keys***. This make it convenient to find these symbols all in one place instead of having to search the entire Dead Key Guide to locate them. Multi-line brackets, superscripts and subscripts and fractions are discussed under their own topics, and are not listed as math symbols here. Some of these characters are not necessarily "math" symbols *per se*, but may be useful when incorporated into documents that have equations and similar notation. Other characters on the same keys that are not math-related are grayed-out.

See Script capitals and Black Letter capitals for additional letters used as math functions and operators.

Arrows are often used in math formulas, but are not considered Math symbols here. See Arrows for more information. The Arrows article discusses combining Arrows that may be useful in **Vector** notation.

Note that **Dead Key 36** (**M**) contains on keys **S**, **O**, **U** and **P** the same math symbols as **Live Keys CC M** and **BB M**, namely, **∑ Ω µ** and **∏**. These redundant entries are present in case **Live Keys CC M** or **BB M** were needed for some other purpose in a future revision of the Q Keyboard. You can remember the Dead Key characters by the acronym SOUP.

The characters ℵ ℶ ℷ and ℸ on ***AU = A B C*** and ***D*** are **Cardinality math symbols** known as **ALEF**, **BET**, **GIMEL** and **DALET**. **ALEF** (or, **ALEPH**) is used to describe the relative of sets. The other symbols have similar set-related purposes. Unicode describes these as the **first, second, third** and **fourth transfinite cardinals**. Even though these symbols are derived from the Hebrew alphabet, they are designated as Left-to-Right letters, so you will not have difficulty inserting them into your documents. For more information, see https://en.wikipedia.org/wiki/Aleph_number.

> For persons more familiar with the Greek alphabet, it may be helpful as a memory aid to think of these symbols in terms of the Greek letter names **Alpha**, **Beta**, **Gamma** and **Delta**, to remember their key locations on the Macron Dead Key.

QWERTY Keys		AA Dead Key Symbols				*AA Held Key Symbols*			
LC key	UC key	AL u+	AL sym	AU U+	AU SYM	AL u+	AL sym	AU U+	AU SYM
Dead Key 00 ` ~									
1	!	2202	∂			222B	∫	222E	∮
2	@	221A	√			222C	∬	222F	∯

3	#	221B	∛			222D	∭	2230	∰
4	$	221C	∜			22BB	⊻		
5	%	22BC	⊼			22BD	⊽		
6	^	2227	∧			2228	∨		
7	&	2229	∩			222A	∪		
8	*	221E				221D			
9	(	212E	℮			2E28	⸨		
0	)	2205	∅			2E29	⸩		
-	_	2212	−						
=	+	2213	∓						
p	P					214A	⅊		
[	{	2045	⁅			27E6			
]	}	2046	⁆			27E7			
\	|	2216	∖						
l	L	2113	ℓ			2104	₤		
,	<	27E8	⟨			27EA	⟪		
.	>	27E9	⟩			27EB	⟫		
/	?	2215	∕						

Dead Key 01 1 !									
`	~	223C				2053			
2	@	218A	↊			00BD	½		
3	#	218B	↋			2153	⅓		
4	$	2756	❖			00BC	¼		
5	%	25C8				2155	⅕		
6	^	25CA	◊			2159	⅙		
7	&	25A3	▣			2150	⅐		
8	*	204E				215B	⅛		
9	(	25C9	◉			2151	⅑		
0	)	044E	ю	042E	Ю	2152	⅒	23E8	
-	_	2243	≃			2244	≄		
=	+	2245	≅			2247	≇	2246	≆
[	{	231C				231E			
]	}	231D				231F			

'	"	2032	′			1E4D	ő	1E4C	Ő
/	?	203B	※			215F	⅟		

Dead Key 02 2 @									
7	&	214B	⅋						
8	*	2051							
9	(	2208	∈	220A		2209	∉		
0	)	220B	∋	220D		220C	∌		
-	_					02D7	ʒ		
=	+	2E40	⸗			02D6	ƶ		
;	:					205A			
'	"	2033	″						

Dead Key 03 3 #									
2	@	25E6	∘						
5	%	2031	‰			2157			
6	^	2310	⌐			221F	∟		
7	&	220E	∎			25AC			
8	*	2042	⁂			215C			
0	)	2218	∘						
-	_	2219							
f	F	214E	ⅎ	2132	Ⅎ	FB00	ff		
;	:	205D	⁝						
'	"	2034	‴			02DD	ƹ		
,	<	2329	〈			226A	≪	22D8	⋘
.	>	232A	〉			226B	≫	22D9	⋙

Dead Key 04 4 $									
3	#	03F6	ϵ			03F5	ϵ		
=	+	225C							
p	P	03C0	π	03A0	Π	03D6	ϖ		
k	K	03BA	κ	039A	K	03F0	ϰ		
;	:	205E	⁞			205B	⁚		

'	"	2057	⁗						
,	<	22B2	⊲			2206	Δ		
.	>	22B3	⊳			2207	∇		

Dead Key 05 5 %									
9	(	26AA	○			26AB	●		
0	)	25CB	◯			25CF	●		
=	+	25A1	□			25A0	■		
[	{	25AB	▫			25AA	▪		
]	}	25FD	▫			25FE	▪		
\	|	25FB	□			25FC	■		
a	A	0105	ą	0104	Ą	2200	∀		
f	F					2109	℉		
c	C					2103	℃		

Dead Key 06 6 ^									
=	+	2259	≙						
;	:	02F8	˸						
c	C	0109	ĉ	0108	Ĉ	2201	C		
/	?	2038							

Dead Key 07 7 &									
7	&	204A				0309	̉		
8	*	22C6				215E	⅞		
9	(	2B26	◇			2B25	◆		
0	)	25C7	◇			25C6	◆		
-	_	22C4	⋄			2B29	⬩		
[	{	02F9	˹			02FB	˺		
]	}	02FA	˺			02FC	˻		

Dead Key 0A 0)									
8	*					2297		229B	
-	_					2296		229D	
=	+	1DCB	ᵒ̃			2295		229C	

,	<	2221				2222			
.	>	2220				2299		229A	
/	?	21AF				2298			

Dead Key 0B - _									
1	!					02E5	˥	2460	①
2	@	01BB	ƻ			02E6	˦	2461	②
3	#	21B0				02E7	˧	2462	③
4	$	21B1				02E8	˨	2463	④
5	%	21B2				02E9	˩	2464	⑤
6	^	21B3						2465	⑥
7	&	21B4						2466	⑦
8	*	21B5						2467	⑧
9	(							2468	⑨
0	)	2011	NB Hyph			2011	NB Hyph	24EA	⓪
-	_	0332	o̲			0305	ō	2E17	⸗
=	+	2010	-			2010	-	A78A	
[	{	2043				23A8			
]	}	2023				23AC			

Dead Key 0C = +									
2	@	224D	≍			226D	≭	246B	⑫
3	#	2056	∺			10FB	⁝	246C	⑬
4	$	2058	⁙					246D	⑭
5	%	2059	⁚					246E	⑮
6	^					A69D	ᵇ	246F	⑯
7	&							2470	⑰
8	*	225B	≛			2257	≙	2471	⑱
9	(					035E	o͞	2472	⑲
0	)	1DCC	ȯ			035F	o̲	2469	⑩
[	{	22A2	⊢			22A4	⊤		
]	}	22A3	⊣			22A5	⊥		
a	A	0101	ā	0100	Ā			2135	

d	D	1E0F	ḏ	1E0E	Ḏ	225D		2138	
g	G	1E21	ḡ	1E20	Ḡ			2137	
;	:	2255				1E7B	ṻ	1E7A	Ṻ
v	V					225A			
b	B	1E07	ḇ	1E06	Ḇ	A69C	ᵇ	2136	
m	M					225E			

Dead Key 1A [{									
/	?	2044	⁄			2044	⁄		

Dead Key 1B] }									
/	?	2044	⁄			2044	⁄		

Dead Key 1C \ |									
`	~					2E1F	~		
8	*	2E0C				2E1C			
-	_	2340	⅄			1DC5	ȍ		
\	|	20E5	⃥	20D2	⃒	0323	̣	20E6	⃦
,	<	22D6	⋖			27D1	⟑		
.	>	22D7	⋗			27C7	⟇		

Dead Key 29 ; :									
`	~	223B	∻			01DC	ǜ	01DB	Ǜ
1	!	2A6B	⫛						
2	@	22AA	⫪						
3	#	205D	⁝			20DB	⃛		
4	$	205E	⁞			20DC	⃜		
5	%	22A2	⊢			22AC	⊬		
6	^	22A8	⊨			22AD	⊭		
7	&	22A9	⊩			22AE	⊯		
8	*	22AB	⊫			22AF	⊮		
9	(	22A6	⊦						
0	)	22A7	⊧						
-	_	00F7	÷						

=	+	2254				01D6	ǖ	01D5	Ǖ
q	Q	2655	♕	265B	♛	211A			
r	R	2656	♖	265C	♜	211D			
p	P	2659	♙	265F	♟	2119			
h	H	1E27	ḧ	1E26	Ḧ	210D			
z	Z					2124			
c	C					2102			
n	N	2658	♘	265E	♞	2115			

Dead Key 2A ' "									
3	#	2443	⑃			22D5			
0	)	2440	⑀					2473	⑳
-	_	29FA				29FB			
=	+	29E7	⧺			22B9			
[	{	A78C	ꞌ			A78C	ꞌ		
]	}	A78B				A78B			
\	|					22BA	⊺		
/	?					2713	✓		

Dead Key 31 X									
9	(	2282	⊂	2286	⊆	2284	⊄	2288	⊈
0	)	2283	⊃	2287	⊇	2285	⊅	2289	⊉
x	X	0259	ə	018F	Ə	00D7	×	02DF	ʔ
/	?	01C1	ǁ			00F7	÷		

Dead Key 36 M									
u	U	00B5	µ			1D58	ᵘ	1D41	ᵁ
o	O	2126	Ω			1D52	ᵒ	1D3C	ᵒ
p	P	220F	∏			1D56	ᵖ	1D3E	ᵖ
[	{	22B7				1D4B	ᵏ		
]	}	22B6				1D53	ᵓ		
\	|	22B8				1D9F	ᶟ		
s	S	2211	∑			02E2	ˢ		
'	"	02B9	′			02BA	″		

,	<	02C2	<			02C4	^		
.	>	02C3	>			02C5	˅		

Dead Key 37 , <									
=	+	2A7D	⩽	2266	≦	2272	≲		
,	<	0326	̦			0327	̧	226A	≪
.	>	2026	…			02BB	ʻ		
/	?	2270							

Dead Key 38 . >									
`	~					2E1E	̰		
1	!	2250	≐			2024	.		
2	@	2251	≑			2025	..		
8	*	22C5	⋅						
-	_	22EF	⋯			A719	ˑ	2238	∸
=	+	2A7E	⩾	2267	≧	2273	≳	2214	∔
\	|	22EE	⋮	22F1	⋱	A717	˖		
;	:	2234	∴			2235	∵		
.	>	0323	̣			0307	̇	226B	≫
/	?	2271		22F0	⋰	A718	˙	0358	̘

Dead Key 39 / ?									
1	!	2241	≁						
2	@	2249	≉						
8	*	2E0D				2E1D			
-	_	233F	⌿			1DC7	̏		
=	+	2262				225F	≟		
e	E	0247	ɇ	0246	Ɇ	212F	ℯ		
[	{	2223				02D5	˕		
]	}	2225				02D4	˔		
\	|	2224				2226			
,	<	226E				200D	ZWJ		
.	>	226F				200C	ZWNJ		

Math symbol live key guide

The following table shows every Math symbol that is defined as a **Live Key**. Some of these characters are not necessarily "math" symbols *per se*, but may be useful when incorporated into documents that have equations and similar notation. In the table below, only use Shift if the **Live Key** is shown ending in **U**.

Live Key	Symbol	U+	Description
ABC 2	∀	2200	For All
ABC 3	∃	2203	There Exists
AC 4	⩽	2A7D	Less Than or Slanted Equal to
ABC 4	⌠	2320	Integral Top
AC 5	⩾	2A7E	Greater Than or Slanted Equal to
ABC 5	⌡	2321	Integral Bottom
CL 6	¬	00AC	Not sign
CU 6	√	221A	Square Root
AC 6	≃	2243	Asymptotically Equal To
ABC 6	∩	2229	Intersection
AC 7	≅	2245	Approximately Equal To
ABC 7	∪	222A	Union
CU 7	∞	221E	Infinity
CU 8	×	00D7	Multiplication Sign
AC 8	≉	2249	Not Almost Equal To
AC 9	≢	2262	Not Identical To
AC 0	∅	2300	Diameter or Empty Set
BL –	°	00B0	Degree Sign
CU –	−	2212	Minus Sign
BC –	•	2022	Bullet
BCU –	⊕	2295	Circled Plus or Exclusive Or
CL =	±	00B1	Plus or Minus
CU =	≡	2261	Identical to
BL =	≈	2248	Almost Equal to
BU =	≠	2260	Not Equal to
ABC [	′	2032	Prime
ABC]	″	2033	Double Prime
ABC \	‴	2034	Triple Prime
BCU [	‵	2035	Reversed Prime
BCU]	‶	2036	Reversed Double Prime
BCU \	‷	2037	Reversed Triple Prime
AC F	ƒ	0192	Function or Florin sign
AC G	′	2032	Prime

AC H	″	**2033**	Double Prime
CL M	µ	**00B5**	Micro Sign
CU M	Ω	**2126**	Ohm Sign
BL M	∑	**2211**	Summation Sign
BU M	∏	**220F**	Product Sign
BU <	≤	**2264**	Less than or Equal to
ABC <	⋘	**22D8**	Very Much Less Than
BCU <	∧	**2227**	Logical And
ABC >	⋙	**22D9**	Very Much Greater Than
BL .	…	**2026**	Ellipsis
BU >	≥	**2265**	Greater than or Equal to
BCU >	∨	**2228**	Logical Or
CU /	÷	**00F7**	Division Sign
BU /	/	**2215**	Division Slash
ABC /	∫	**222B**	Integral
BCU /	∂	**2202**	Partial Differential

See Understanding modifier key notation for an explanation of modifier codes.

Modifier letters

The Q Keyboard supports a number of Unicode Modifier Letters.

For a complete list of all modifier letters, see Modifier Letter Guide.
For a list of all supported IPA symbols (which includes modifier letters), see Phonetic symbols.

An interesting overview of this subject can be found on Wikipedia at:
https://en.wikipedia.org/wiki/Phonetic_symbols_in_Unicode

Many symbols in Unicode that are called Modifier "letters" are not actually letters, but are tone marks, pronunciation guides and phonetic symbols used by linguists. Some of these occasionally find their way into general-purpose alphabets. The Q Keyboard does not have the capacity to represent every Unicode phonetic symbol. The approach that was taken is where a "modifier letter" resembles a basic Latin letter, it is included. Symbols beyond these are considered on a case-by-case basis.

> Unicode contains a small number of modifier letters (just six) described as **Small** Capitals. Because of space constraints, limited availability and similarity to regular capital modifiers, these are not included. For instance, while the letter **Modifier Letter Capital N** is on the keyboard, **Modifier Letter Small Capital N** is not.
>
> Unicode does not define a character called "**Modifier Letter Small N**" but does have a "**Superscript Latin Small Letter N**". Because it is desirable for the Modifier Key M be as complete as possible, this symbol is on Dead Key M, serving in the role of a substitute Modifier Letter Small N. So, to type something like **2ⁿ** you would use ***Held AL M N*** rather than something on Key 9.

With very few exceptions, modifier letters that resemble Latin digraphs or ligatures, or resemble extended Latin letters like **ŋ Eng** or **ð Eth**, or resemble turned, inverted or reversed Latin letters are not used, because there are simply too many of them to be included. The supported IPA symbols include IPA tone marks. Unicode also contains additional types of marks that could not be included. Some of these letters are IPA extensions or general Unicode phonetic extensions, which are not part of "IPA proper". Linguists **do** use them, but they are outside the IPA standard.

A few additional symbols are also supported, when documentation was found showing they have been used in everyday languages. Note that some Tone Marks that resemble digits are present on the Q Keyboard. For more information, see the Wikipedia article on the Zhuang language, and consult the box labeled "Tones". The Zhuang tone system has been superseded, but remains part of Unicode.

There are also a large number of Tone Mark modifier letters which consist of horizontal and vertical lines and/or dots. The **Tone Bar** symbols supported on the Q Keyboard are

discussed here.

Many Modifier Letters resemble superscript alphabetic forms. Because a number of these have both upper and lower case forms, and are about the same size, shape and location as superscripts, they can often substitute for superscript alphabetics when there are no official Unicode superscripts available. See Superscripts and Subscripts for more information.

See Key M 36: Miscellaneous for a complete list of every Modifier letter available on **AA M**.

There are also three modifier letters on Key = 0C for superscript versions of Cyrillic **Н**, **ь** and **ъ**. The modifiers for **ь** and **ъ** are present in few fonts. The modifier for Cyrillic **Н** is used the most among these three. If there is no symbol for this in the font you are using, you can substitute **Modifier Letter Capital H** on ***AU M H***, which will often have a glyph of identical size and shape.

Example:

The Modifier Letter ^{e} is on ***Held Key AL M E***

- hold the **AA** key
- type **M**
- type **E**; the ^{e} symbol appears
- release the **AA** key

Example:

The Modifier Letter ^{E} is on ***Held Key AU M E***

- hold the **AA**+Shift keys
- type **M**
- type **E**; the ^{E} symbol appears
- release the **AA** and Shift keys

See Understanding modifier key notation for an explanation of modifier codes.

Multi-line bracketing and math symbols

The Q Keyboard allows you to type multi-line composite "bracketing" and math symbols. You can type a matrix, a set, a parenthesized group of information, or an equation that spans several lines. When the information being enclosed within the bracketing symbols has a relatively simple format, you can enter it as ordinary text without having to resort to an advanced word processor or equation editor.

The supported multi-line composite symbols are:

- **( )** Left and right parentheses
- **[ ]** Left and right brackets
- **{ }** Left and right braces
- **∫** Extendable integral sign
- **∑** Two-line summation symbol

See examples below.

Conceptual background of composite bracketing symbols

1. Each symbol is defined in "sections". These are referred to as:
   - the "top" section
   - the "bottom" section
   - a vertical "extender" section

2. There are some additional considerations:
   - the two-line **∑** summation symbol does not have an extender section
   - the **{ }** brace symbols also have a vertical "middle" section, where the middle section for the left brace "points leftward" and the one for the right brace "points rightward"

3. The vertical extenders are **not** interchangeable. Each character's size and horizontal alignment vary from one type of bracketing symbol to the next, and from one font to another. The extenders are only guaranteed to connect properly if they are of matching types. When you compose a multi-line bracketing symbol, **you must combine *like with like***, and not mix one type with another. In a few cases you might get away with that, but for most fonts the mismatched symbols won't line up correctly and will be unattractive.

4. The **brace** extenders actually are interchangeable. However, they are defined redundantly as if they were not interchangeable. That was done so that you could treat all the extenders the same way, and not have to think about this or make a special case out of typing braces.

5. When these symbols are not the left-most characters on a line, or are not being used in a monospaced font, you will need to use hard tabs when placing them in the middle of a line in your document. Or, you could place them within a "box" of a formatted table in a word processor. Otherwise, you would not be able to ensure the alignment of the various pieces of each composite symbol.

6. Successful composition of bracketing symbols requires a suitable, well-designed font. These symbols are present in several fonts, but few do a good job of connecting each of the pieces together so that the complete symbol is properly aligned and looks like a single glyph without gaps showing. Of all the fonts tested, DejaVu Sans had the best overall appearance.

7. Most fonts, including DejaVu Sans, do not define the multi-line summation symbols, and few of them compose well. Two fonts that do have these are Quivira and Segoe UI Symbol. **The summation example below uses Quivira**. Every font tested for the multi-line summation symbol, except Quivira, caused a gap to appear between the top and bottom. This is an area where font suppliers need to provide better support.

8. The composite braces are not as flexible as the others. You cannot "officially" create a brace with an even number of lines. For a two-line brace, you could omit the "middle" section. The result will be distinctive, and would look neither like a brace nor a parenthesis, because it would lack the "pointed" middle section. For larger, even-numbered braces, you can combine alternating pieces of Open Braces and Close Braces together. The point of the "middle" section may be slightly thicker, but it should still look like a brace. This technique could be also applied to two-line braces, so they would have the pointed section, but not the sections normally on the top and bottom. It is easier to see this visually than trying to explain it in words. See examples below.

9. The brace symbols can be used as a substitute for the integral symbols, by combining the top section of an opening brace with the bottom section of a closing brace. This will look much like a "real" composite integral sign, except that the ends on the top and bottom are not quite as rounded.

How to type composite bracketing symbols

These composite symbols are typed as either **Dead Keys** or ***Held Keys***, depending on which kind of symbol you are composing. This two-step process works as follows.

> Note that the Shift key is not used. To emphasize the nature of the composite symbols being produced, the keys used are shown as **( ) { } $ | <** and **>** in the discussion below instead of the unshifted symbols on those keys, for documentation purposes. Even though this is done, **do not use Shift.**

First, press the **Dead Key** or ***Held Key*** that selects which kind of "section" you want to type. There are four Dead/Held keys corresponding to the four different kinds of sections:

- Key 37 on **<** is used to select a "top" section
- Key 38 on **>** is used to select a "bottom" section
- Key 1C on **|** is used to select an "extender" section
- Key 0B on **–** is used to select a "middle" section **for brace symbols only**

Second, press the key that represents the kind of symbol you want:

Keys		Typed as	Purpose
(	**)**	**Dead Keys**	**Composite ( ) Parentheses**
[	**]**	**Dead Keys**	**Composite [ ] Brackets**
{	***}***	***Held Keys***	**Composite { } Braces**
$		**Dead Keys**	**Composite ∫ Integral**
$		***Held Keys***	**Composite two-line ∑ Summation**

When typing the symbols for the **Braces** or the **Summation**, be sure to type **every** symbol as ***Held Key*** characters; otherwise, incorrect characters will appear. As usual, when typing a ***Held Key*** you must continue to hold the **AA** modifier until you have typed the final character of the sequence.

<u>Complete guide to composing multi-line symbols</u>

As usual, **keys** shown in ***red italics*** are **Held Keys**.

Do not use Shift for any of these characters.

For example, the sequence **AL < (** means:
- hold **AA** without Shift
- type the **,** comma key that also has **<** printed on it
- release both keys
- type the **9** key that also has **(** printed on it

The Descriptions below are slightly modified from the Unicode documentation, to help tie them to the discussion above. For instance, the official description of **U+239B** is Left Parenthesis Upper Hook, rather than Left Parenthesis Top Section.

Dead Key	Symbol	U+	Description
AL < (	⎛	**239B**	**Left Parenthesis Top Section**

AL | (	⎜	**239C**	**Left Parenthesis Extender Section**
AL > (	⎝	**239D**	**Left Parenthesis Bottom Section**

Dead Key	Symbol	U+	Description
AL <)	⎠	**239E**	**Right Parenthesis Top Section**
AL |)	⎟	**239F**	**Right Parenthesis Extender Section**
AL >)	⎞	**23A0**	**Right Parenthesis Bottom Section**

Dead Key	Symbol	U+	Description
AL < [	⎡	**23A1**	**Left Bracket Top Section**
AL | [	⎢	**23A2**	**Left Bracket Extender Section**
AL > [	⎣	**23A3**	**Left Bracket Bottom Section**

Dead Key	Symbol	U+	Description
AL <]	⎤	**23A4**	**Right Bracket Top Section**
AL |]	⎥	**23A5**	**Right Bracket Extender Section**
AL >]	⎦	**23A6**	**Right Bracket Bottom Section**

Held Key	Symbol	U+	Description
AL < {	⎧	**23A7**	**Left Brace Top Section**
AL | {	⎪	**23AA**	**Left Brace Extender Section**
AL – {	⎨	**23A8**	**Left Brace Middle Section**
AL | {	⎪	**23AA**	**Left Brace Extender (repeated)**
AL > {	⎩	**23A9**	**Left Brace Bottom Section**

Held Key	Symbol	U+	Description
AL < }	⎫	**23AB**	**Right Brace Top Section**
AL | }	⎪	**23AA**	**Right Brace Extender Section**
AL – }	⎬	**23AC**	**Right Brace Middle Section**

AL | }	⎪	**23AA**	**Right Brace Extender (repeated)**
AL > }	⎭	**23AD**	**Right Brace Bottom Section**

Dead Key	Symbol	U+	Description
AL < $	⎰	**2320**	**Integral Top Section**
AL | $	⎮	**23AE**	**Integral Extender Section**
AL > $	⎱	**2321**	**Integral Bottom Section**

Held Key	Symbol	U+	Description
AL < $	⎲	**23B2**	**Summation Top Section**
AL > $	⎳	**23B3**	**Summation Bottom Section**

Exhibits of composed symbols

⎛ ⎞

⎡ ⎤

⎧ ⎫

⎰

⎲

Exhibits of braces with even numbers of lines

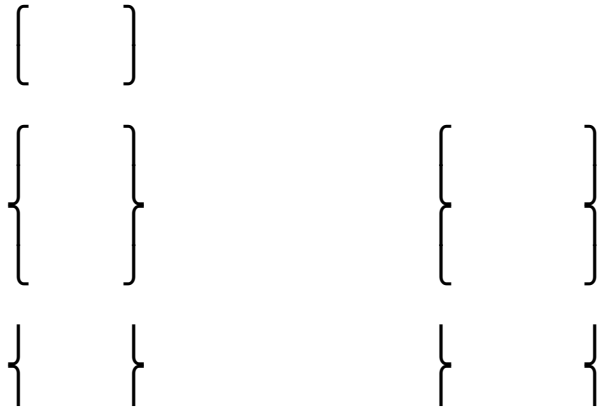


Exhibit of integral sign made with brace characters

Notable symbols and punctuation

This section describes a number of notable and useful characters that you might have overlooked.

1. **Live Key CL –** is the · **Middle Dot. Catalan** has a *geminated* letter **l· and L·** which is available as **Live Key BB ;** (semicolon) or as an "**L with Dot Above**" on the **AA . L** Dead Key. Typists that don't have this available on their (non **Q**) keyboard use the Middle Dot to compose it manually, when they need to type **l·l** and **L·l**, since **LL** and **L·L** are pronounced differently.

   The **L· with Middle Dot** can be placed on the Dot Above dead key because there is no accented **L** that actually has a Dot Above.

Middle Dot is used in **Occitan** to signify **n·h** and **s·h** as alternative forms of digraphs **nh** and **sh**. Middle Dot may also be used for separators in places that otherwise might have used dashes, such as parts of telephone numbers like **800·555·1234**.

See https://en.wikipedia.org/wiki/Gemination for an explanation of Gemination.

   French typists have recently shown an increased interest in the use of · **U+00B7 Middle Dot** (French, *point médian* **or** *point milieu*). The main area of interest appears to be in describing "optional pieces of words" that showed choices in the number or gender of some person or object. This style of composition is called "inclusive writing" (French, *écriture inclusive*) because the intent is to write in French so that it does not imply exclusion of persons on the basis of number or gender. In English, the closest similar spelling would be to use parentheses, like "word(s)" to mean "word or words". In French, it is as though they wanted to type "word·s".

   Note that the Unicode standard defines other, similar-looking dots. The **Sinological Dot** and the **Greek Ano Teleia** punctuation are not supported. The **Hyphenation Point** · may be found on **Live Key CU 9**. The **Dot Operator** math symbol · is on **Dead Key AL . 8** and has limited availability. Some fonts may or may not show a slight difference in the appearance of Middle Dot and these other dot forms. Of all these symbols, Middle Dot has the most complete coverage in popular fonts, and will serve well as a substitute for Dot symbols that are not available.

2. **Live Key BL –** is the ° **Degree** symbol. In addition to its usual purpose, some languages use this to serve as a modifier letter or other linguistic mark. An alternative to using the degree symbol that way is to use the Modifier Letter **O** instead, on ***Held Key AA M O*** • Based on your requirements, you would have to determine whether the lower-case or upper-case modifier letter O met your needs. See below for ℃ and ℉ symbols.

3. **Live Key AC 0** (zero) is the ⌀ **Diameter** symbol, present on the German T2 keyboard.

There is also a similar-looking but larger ∅ **Empty Set** symbol on ***Held Key AL `0*** (zero). These should not be confused with the Scandinavian letter O with slash stroke **ø Ø**, on **Live Key CC 0** (zero).

4. **Live Key AC M** is the ♪ musical eighth note, present on the Canadian Multilingual keyboard and others.

5. **Hyper keys on the numeric row** contain math symbols, additional musical notation, and digraphs of accented symbols present in some African languages and others, which are compositions. See the section on Hyper Keys for more information. When the letter keys A to Z are typed as Hyper Keys, a Macron or Macron Below is added to the letter.

6. The ∞ **Infinity** symbol is on Live Key **CU 7**. You can find this and a large number of other math symbols on the keyboard. See Math Symbol Live Key Guide and Math Symbol Dead Key Guide for more information. Infinity is also on **Dead Key AL ` 8** • If you type this as ***Held Key AL `8*** it will give you the similar looking math symbol ∝ which is **Proportional To**.

> It would have been easier to remember if the Live Key version of ∞ had been put on key **8** somewhere instead of key **7**. The reason this was not done is that key **8** is being used for the **§** section symbol and the **×** multiply symbol, which are frequently used in business. While the ∞ infinity symbol is occasionally needed, it is not as important and warrants a lower priority.

7. The symbol on ***Held Key AL / .*** and **Live Key AC ** is a **Zero Width Non Joiner**, ZWNJ. This is used in languages like German, to mark places in long compound words where sections of a word can be split across lines. That is important if the compound word is very long, since the ZWNJ can help a word processor do a better job of formatting lines, while not splitting words when it is not necessary. As with much of Unicode terminology, this is a confusing description, since the code defines places where a word can optionally be broken, rather than where it can be joined. A better term might have been, "Zero Width Conditional Split-Point". See Spacing and joining symbols for more information. Because the ***Held Key*** version of this character uses close-together keys, you should be mindful of Issues with Held Keys and N-Key Rollover when typing this.

8. Note that there is **Live Key** support for **æ** and **ǽ** with Acute, but not **ǣ** with Macron, which requires a **Dead Key**. These are typed as follows:

- **æ Æ** is on **CC Q**
- **ǽ Ǽ** is on **CC W**
- **ǣ Ǣ** is on **AA = Q**

The reason it's done this way is because **ǣ** with Macron is used for academic purposes and in transcribing Old English, while **æ** and **ǽ** are actively used in contemporary languages. **Æ** is widely used, while **Ǽ** appears in Danish and Icelandic. The letter **ǣ** is reportedly present in some African languages (though it was not determined which ones), according to the following **Script Source** web site:

http://scriptsource.org/cms/scripts/page.php?item_id=entry_detail&uid=hgn4alf2lf

9. Note the capital letter **J with Caron** on **Live Key AC J**. Some languages specify an upper-case **J** with Caron, but Unicode does not define one. To produce this requires a composition of J with a combining Caron symbol. Because automatic compositions of this type amount to a digraph, and the keyboard architecture does not allow digraphs to be defined as **Dead Keys**, this symbol was placed here as a **Live Key**, rather than as a Dead Key on **AA]** where the lower-case **ǰ** with Caron is found.

Since capital **J** rarely takes a Caron (or any other accents), the glyph attributes in most fonts do not define **J** so as to allow a Caron to be properly placed; the accent may be misaligned or otherwise unattractive, **and may or may not appear correctly in this Help document**. You must test your fonts in your applications to confirm this will work.

10. The hyper key **U+1F12F BCU '** (apostrophe) is the "CopyLeft" symbol, which became part of Unicode as of release 11 of the standard. To produce a **trigraph (ɔ)** approximation of this, you can use Hyper Key **ABC '** (apostrophe). This creates a Small Letter **Open O** in parentheses. This key will produce the correct Unicode code point, but there are few fonts that implement this symbol. Fonts are revised all the time, so you should check with your font vendor to see if support has been added. **Update**: As of February 2019, the most recent Roman Cyrillic Std font supports CopyLeft.

11. **Live Key BC –** contains the Bullet •. This can be useful when creating bulleted lists without the help of a word processor.

12. The symbols **¢ Cent** and **¬ Logical Not** on **Live Keys CL 2** and **CL 6** are present in the IBM EBCBIC character set, and may be useful if a Q Keyboard were connected to an IBM mainframe system using a 3270 terminal emulator program.

13. The **angle quotes « »** on **Live Keys CU <** and **CU >** (**CC** + Shift) contain integrated non-breaking spaces**. *In addition***, the angle quotes **« »** on **Live Keys AC <** and **AC >** contain integrated ***narrow*** non-breaking spaces. These are present because the orthography of French and other languages often call for these quotes to be typed with adjacent spaces, and it is desirable not to have them "orphaned" across lines. Other languages may or may not use spaces with their quotes this way. Simple **« »** angle quotes without embedded spaces are on the unshifted **Live Keys CL <** and **CL >** • Because some word-processing software may already take this situation into account, you need to know your environment to determine which angle quotes to use. The **narrow** non-breaking space character is not available in all fonts, so you must verify its availability if you want to use these special quotes. If those narrow non-breaking spaces are used when they are missing from your font, your document will be formatted incorrectly. In addition, be aware that some software such as word processors may not even recognize narrow non-breaking spaces as a legal character, even if your font defines it, so testing of this feature is important.

14. The **En Dash and Em Dash** on **Live Keys BC [** and **BC]** are followed by a non-breaking

space. These are used in some European languages to introduce quoted text, and for quotations that appear in literary dialogs and theatrical scripts. See Quotes and related symbols for more information.

15. The "**script L**" symbol **ℓ** on **AL ` L** may be used as an abbreviation for the metric unit "**liter**" or "**litre**", and in mathematical notation when it is important to make clear that a lower-case **L** is not the digit **1**, such as using **ℓ** as a variable to signify "**length**" or "**line**".

16. Note the **Live Key** masculine and feminine ordinal symbols **º** on **AC O** and **ª** on **AC A**. On other international keyboards, you will often find these symbols on keys **M** and **F**.

17. The **ꝛ** symbol on **AL 7 7** is the **Tironian Et**, an archaic letter sometimes used in Ireland and Scotland to mean "**and**". The Tironian Et is one of the few surviving Tironian Notes, a shorthand writing system that originated in the Roman Empire around the 1st century AD. To create this, you must hold the **AA** key and type **7**, then release both keys and type the **7** key a second time without **AA**. The **Tironian Et** is unrelated to the archaic **Latin Letter Et ȝ 3** on ***Held Key AA 8 3***.

18. The **Dutch** digraphs **ij** and **IJ** are found on **Live Keys AB J** and **BC J**. In addition, the following **digraph triples** are available using the modifiers **AB**, **BC** and **AC** respectively. Because native support for these digraphs is usually missing on national keyboards, they are often typed as separate letters. Additional digraphs:

On L: **lj Lj LJ**
On N: **nj Nj NJ**
On D: **dž Dž DŽ**
On R: **dz Dz DZ**

19. **Live Keys AB ** and **BC ** contain **íȷ** and **ÍJ**. These are compositions of the **Dutch** letters **ij** and **IJ** with Acute accent on the first letter, and dotless **ȷ** for lower case. See discussion about Dutch IJ for more information.

20. The **Breton** language has a symbol with **C** and **H** and a middle apostrophe, treated as a letter in its own right. A photograph of a Breton keyboard, which goes by the name **C'HWERTY**, can be found here. The special characters on a Breton keyboard bear a resemblance to a French AZERTY, though it does not actually use the AZERTY key order. There are no composite symbols for **C'h** in Unicode as there are for **Dž** and others noted above. Typing these three characters is a bit tricky and time-consuming if done manually, but you can easily produce them on the Q Keyboard using **Live Keys** on **V** for the following trigraphs:

AB V = c'h
BC V = C'h
AC V = C'H

21. Be sure to take a close look at Key 31 X and Key 36 M to see the large number of the

Extra and **Miscellaneous** letters and symbols that are available as Dead Key and Held Key characters. A number of these letters (most on key **X**) can be used to write African languages.

22. On Key 0A **(0)** you will find **Combining Small Letters** as ***Held Keys***. These symbols are used by linguists, and occasionally in some scripts. For instance, you can put a small letter **e** on letter **O** as **o̊** using **o** ***AU 0 E***. The readability of these combining letters varies considerably, based on the font type and font size used. In testing, the fonts Calibri, DejaVu Sans and Roman Cyrillic Std worked successfully.

23. Key 07 contains several **Retroflex Hook** letters, and Key 0A contains **Palatal Hook** letters plus a few additional **Retroflex** letters. These are ***Held Key*** characters. They are mostly used as phonetic symbols; a few have been adopted into regional languages. All are lower-case letters, except for **Ʈ** on ***Held Key AU 7 T*** which is Capital T with Retroflex Hook. Unless you are familiar with these letters, it can be hard to remember which is which. The Palatal hooks curve leftward; the "hook part" resembles a small letter J. The Retroflex hooks curve rightward. (You might remember this by noting that "retroflex" and "right" both start with "**R**".) A few letters exist in more than one hook shape, so you will need to select them carefully. If you need to manually add such hooks, note these specialized comma-like combining modifiers on Cedilla Key 37:

- ***Held AL , J*** has ʝ U+0321 Combining Palatalized Hook Below
- ***Held AL , L*** has ɽ U+0322 Combining Retroflex Hook Below

If you look closely, you will see that the Palatalized Hook curves to the left, like letter J, and the Retroflex Hook curves to the right, somewhat like letter L. The similarity in shapes may help you to remember which keys they are on.

24. In addition to the Retroflex and Palatal Hook letters, there are two letters with a hook-***like*** appearance that are not actually "hook" letters. These are **S** and **Z** with **Swash Tail**. To keep these separate from the keys for Retroflex and Palatal hooks, the Swash Tail letters are defined as ***Held Keys*** on ***AA 5 S*** and ***AA 5 Z***

One of the designated purposes of Dead Key 05 is for "descender" letters, and the Swash Tail is "sort of" a descender on these letters, which have both upper-case and lower-case forms.

25. To help you remember which Dead Key is used for which Hook and Tail symbols:

- Dead Key 0, used for **Palatal** Hooks, is just "northwest" of key **P**
- Dead Key 7, used for **Retroflex** Hooks, is closer to the **R** key than the 0 is
- Dead Key 5 is used for **Swash** Tail, and "**5**" resembles "**S**"

These "hints" are admittedly a stretch of the imagination, and may or may not help.

Note: The Unicode Consortium has plans to incorporate **more** letters with Palatal and Retroflex hooks, some of which are capital forms of existing letters. These plans are only preliminary and have not reached final approval. Once they are approved, they may be considered for inclusion in a future revision of the Q Keyboard. Since these letters are not included in release 11 of the Unicode standard in June of 2018, they are not likely to be part of the standard until 2019 at the earliest.

26. On ***Held Keys AL 8 B*** and ***AL 8 P*** are the **DB** and **QP** ligatures **ȸ** and **ȹ** used by some African linguists.

27. The prescription ℞ symbol is on **AA M R**, which can be typed with or without Shift. There are also a number of Apothecary symbols available, most of which are considered archaic or deprecated.

28. There are several **caret** or caret-like symbols, besides Circumflex ^ on Shift 6. Font availability may be limited. For the **Low Circumflex Accent**, it doesn't matter if you hold **AL** or not when typing the Spacebar; it will work either way. The other symbols on **AL** are **Dead Key** characters. Notice how the **Caret Insertion Point** looks like **^** and **/** combined.

- **U+2038 Caret** ‸ is on **AL 6 /**
- **U+2041 Caret Insertion Point** ⁄ is on **AL / 6**
- **U+02C6 Modifier Letter Circumflex Accent** ˆ is on **AL 6 Space** and **AL [** **BL [**
- **U+A788 Modifier Letter Low Circumflex Accent** is on **AL [Space** and **AL 6** **BL 6**

29. The **Three-dot Ellipsis …** is present on some European keyboards, such as German and French. You can type this symbol as **Live Key BL .** (period) or on **Dead Key AL , .** (comma period). Do not use Shift.

30. There are a number of special-purpose symbols having exclamation points or question marks. The first three are used in Spanish. Forms of interrobang are used infrequently, since few keyboards support them and typists are used to using discrete forms like !? instead of a dedicated symbol. Symbols ¡ and ¿ are common but the rest may have limited font availability.

- **U+00A1 Live CL 1** is the inverted exclamation point **¡**
- **U+00BF Live CL /** is the inverted question mark **¿**
- **U+2E18 Live BC 1** is the inverted interrobang symbol **⸘**
- **U+203D Live AC /** is the regular interrobang symbol **‽**
- **U+2E2E** ***Held AU ? ?*** is the reversed question mark ⸮ used to show **irony**. To type this symbol, hold **AA+Shift** and type the **/?** key **twice**.

There are also four symbols on Key **M** for digraphs of exclamation points and question marks. Note that the **Dead** keys have two of the same symbol, while the ***Held*** keys have one of each, and that the **first** character in each digraph relates to the key it is on.

- **Dead Key AL M 1!** has ‼
- ***Held Key AL M 1!*** has ⁉
- **Dead Key AL M /?** has ⁇
- ***Held Key AL M /?*** has ⁈

31. The characters ℵ ℶ ℷ and ℸ on ***Held Keys AU = A***, ***AU = B***, ***AU = G*** and ***AU = D*** are **Cardinality math symbols**, known as ***ALEF***, ***BET***, ***GIMEL*** and ***DALET***. ALEF (or, ALEPH) is used to describe the relative size of sets. The other symbols have similar set-related purposes. Unicode describes these as the **first, second, third** and **fourth transfinite cardinals**. Even though these symbols are derived from the Hebrew alphabet, they are designated as Left-to-Right letters, so you will not have difficulty inserting or deleting them in your documents.

For persons more familiar with the Greek alphabet, it may be helpful as a memory aid to think of these symbols in terms of the Greek letter names **Alpha**, **Beta**, **Gamma** and **Delta**, to remember their key locations on the Macron Dead Key.

For more information, see:
https://en.wikipedia.org/wiki/Aleph_number
https://en.wikipedia.org/wiki/Beth_number
https://en.wikipedia.org/wiki/Gimel_function

32. The playing-card symbols for ♥ Hearts, ♦ Diamonds, ♣ Clubs and ♠ Spades are on ***Held Keys AL 1 H***, ***AL 1 D***, ***AL 1 C*** and ***AL 1 S***. Only the black symbols are supported, since the white symbols are present in very few fonts.

33. You can type Chess notation like ♕ and ♘ using the **AA : Dead Key**. The Shift key selects between **white** (lower-case) and **black** (upper-case) pieces. Checkers (Draughts) symbols are also available. See Chess and games for more information.

34. Degrees Celsius **U+2103** ℃ and Fahrenheit **U+2109** ℉ are on ***Held Key AL 5 C*** and ***AL 5 F*** • You may be able to remember this by thinking of the **%** percent sign on the **5** key as if it had two ° **degree** marks on it. Font availability is limited. The only advantage of using these symbols instead of using a degree mark and C or F separately is that the two parts are closer together than if typed individually, and cannot get split across lines.

35. Note these special Unicode formatting characters:

- ***Held AU / R*** **U+FFFD** **Replacement Character**
- ***Held AU / P*** **U+2029** **Paragraph Separator**
- ***Held AU / L*** **U+2028** **Line Separator**

The usability of these characters may vary by application. The Replacement Character is available in few fonts, so it may or may not have a visible glyph, but when it does it is often a question mark inside a diamond. Note these characters require Shift. These were

made available in part to support certain requirements for African languages.

36. Note these various **Live Key** and **Dead Key** business symbols:

- **AC T** is the trademark symbol ™
- **AC C** is the copyright symbol ©
- **AC X** is the registered trademark symbol ®. For some reason, this symbol appears much smaller than the copyright symbol © does in many fonts, despite the similarity of design. In the Dejavu Sans font shown here, the symbols have comparable size.
- **AC Z** is the service mark symbol ℠
- **AL 3 P** is the Sound Recording Copyright symbol ℗
- Telephone symbol ℡ and Facsimile symbol ℻ are on **AL 1 T** and **AL 1 F** respectively. The Fax symbol is available in fewer fonts than the Telephone symbol, and both are somewhat uncommon.
- **AC Q** is the Danish business symbol ⅍ known as *Aktieselskab*
- **CL 5** is the per-thousand symbol ‰
- **CU 5** is the in-care-of symbol ℅ • Note that ‰ and ℅ both resemble **%** on the 5 key.
- **AL 3 5** contains the per-ten-thousand symbol ‱
- **AC 3** is the number symbol **№** • Note that the 3 key has **#** which is also known as a "number sign". This may help in remembering that **№** is located here.

Dead Key ` 00 (grave) also has a number of business symbols.

See Understanding modifier key notation for an explanation of modifier codes.

OCR symbols

The Q Keyboard enables you to type the **OCR symbols** in the U+2440 to U+244A block of Unicode. These are the kinds of symbols seen on the bottom of bank checks (cheques) and other financial instruments.

The following points should be kept in mind regarding these symbols:

- In order to display ***numbers*** in OCR format, use regular decimal digit characters with an OCR font. The digits that are squarish and technical-looking are called **OCR-A**; these look like ⑆⑇⑈⑉⑊⑋⑌⑍⑎⑏. There is also **OCR-B**, which more closely resembles a regular font, and they look like 0123456789. Windows has two built-in fonts you can use for this purpose, which are OCR-A II and OCR B MT. These two fonts also have letters.

  Note: In Windows 10, it appears that the OCR font files are not included by default; these have file names of **OCRA2_P.TTF** and **OCRBMT.TTF**. If you have recently upgraded to Windows 10 from an earlier version, you may be able to copy and install these files from your old system, which should be located in the **C:\Windows\Fonts** directory. These fonts are included with several Microsoft products, so if you have installed a recent version of Microsoft Word or Office, they may get included that way.

- The primary intent of OCR always was to recognize **numbers**, and so OCR **letters** are almost an afterthought. It is possible to create documents containing OCR-A letters, but most people would find them unpleasant to read. OCR-B is better at being human-readable, but because the priority of OCR was the recognition of numbers, there is little support in either OCR-A or OCR-B for non-English accented letters. It may be that the most likely uses for OCR letters are in things like alphanumeric codes and part numbers that only use English letters A-Z. When used for that purpose, OCR letters most likely will only appear as upper case, even though the fonts themselves should have lower case also.

- The OCR symbols shown below are present in few fonts. Most that do have them tend to contain only the first three symbols ⑀⑁⑂ at U+2440 to U+2442. One font that does contain all of them is Arial Unicode MS. Surprisingly, even commercially available OCR fonts do not always contain all of these symbols. It is important to carefully research this before purchasing any OCR font to be sure it meets your needs.

  Other fonts that have all the symbols are **Everson Mono**, **Quivira** and **Segoe UI Symbol**. Of all these, **Arial Unicode MS** has the most accurate symbol rendering. OCR A and OCR B from Microsoft have none of the Unicode-defined code points for OCR symbols,

though OCR A has ⊓ at U+00F0 and ⊔ and U+00FD, which are improper locations for these characters.

- Because the use of OCR predates Unicode, some fonts that contain these symbols may define them as 8-bit ASCII character values, rather than using the standard code points of Unicode. Unless you are operating with an 8-bit "code page" that translates Unicode to an 8-bit character set, and also translates these OCR characters to appropriate 8-bit values, you would not be able to use them. Non-Unicode use of OCR symbols in the past had little or no standardization, so different systems would use different codes for the same symbol. IBM also has its own 8-bit EBCDIC encoding for OCR symbols, which is completely different than any Unicode or ASCII encoding.

- Be aware that if you intend to produce documents with OCR characters that are negotiable bank instruments, most financial institutions require that you use **MICR ink** or **MICR toner** (Magnetic Ink Character Recognition) for printing. MICR characters are simply OCR characters that are printed with MICR ink or toner. (You need to confirm that the glyphs are in fact correctly designed for your needs.) Printing with non-MICR ink could result in documents being rejected. You would have to contact the manufacturer of your printer, or a third-party vendor of printing supplies, to determine if MICR ink or toner is available for your device. Even if you use MICR ink or toner with your OCR, if you intend to create a negotiable document of significant monetary value, you should first print a "test transaction" with the smallest possible value (such as $ 0.01 in U.S. currency) and submit it to your bank for processing, to verify that your printing and document format will be accepted. If you have not prepared such documents before, you may wish to contact your financial institution for advice on current best practices in printing OCR/MICR-readable documents.

The OCR symbols below are on Key 2A, the Acute Accent key, as **Dead Key** characters. For instance, to produce the ⊓ symbol, type **AL ' 1** as a dead key; be sure to release **AA** before typing the final key. The list below, taken from the Key 2A Dead Key Guide, shows these symbols with a **violet** background.

Notice that for each of these symbols except U+244A, the last digit of the Unicode value is the same as the digit key where the symbol is located.

QWERTY Keys		AA Dead Key Symbols				*AA Held Key Symbols*			
LC key	UC key	AL u+	AL sym	AU U+	AU SYM	AL u+	AL sym	AU U+	AU SYM
`	~	244A	\\			1DC9	õ		
1	!	2441	⊓						
2	@	2442	⊔						
3	#	2443	⊓̣			22D5			
4	$	2444	⊓̈						

5	%	2445	⋈						
6	^	2446	⁝						
7	&	2447	⁚			0453	ŕ	0403	Ŕ
8	*	2448	⁞						
9	(	2449	⁙						
0	)	2440	⁛					2473	⑳

Phonetic symbols

The tables below contain symbols from the **International Phonetic Alphabet**, or **IPA**, as well as some additional ones that may be useful in phonetic transcription that are not strictly part of IPA. All known symbols defined in the 2015 IPA standard have been implemented. Note that the IPA standard also includes some ordinary lower-case letters from Basic Latin, which are not shown.

Quick links:

- For **Live Key** guide, click here
- For **Dead Key** guide, click here
- For **Phonetic Cross-Reference**, click here

For more information on the IPA transcription system, see https://en.wikipedia.org/wiki/International_Phonetic_Alphabet

IPA is not the only phonetic alphabet. There is a **Uralic Phonetic Alphabet** (UPA), also known as the Finno-Ugric transcription system. The Q Keyboard contains many, but not all symbols from the UPA; some 40 UPA characters out of 230 are currently unavailable.

For more information on the Uralic transcription system, see https://en.wikipedia.org/wiki/Uralic_Phonetic_Alphabet.

There is also **Americanist Phonetic Notation** (APN), also known as the [North] American Phonetic Alphabet (APA or NAPA). The Q Keyboard contains most, but not all symbols from the APN.

For more information on the APN transcription system, see https://en.wikipedia.org/wiki/Americanist_phonetic_notation.

To find symbols from **UPA** or **APN** which might be available but are not shown below, you would have to review the Dead Key Guide or check the Appendix. Of the three systems, IPA is generally used the most often.

Should there be a user demand for UPA or APN symbols not currently defined, these could be considered in a future revision of the Q Keyboard. To enter unsupported symbols into your documents, you would have to use a **Character Map** or **Alt X** method. The Q Keyboard cannot support every phonetic symbol, such as some IPA Extensions, as desirable as that would be to address the needs of linguists, because the large number of symbols exceeds the capacity of the keyboard.

Note about Americanist Phonetic Notation

While a few Unicode-defined symbols used in **APN** are missing from the Q Keyboard, APN also uses notation that does not exist in Unicode at all. For instance, APN has superscript-like letters and symbols which themselves have diacritics, such as **ḍᶻ** and **pᵂ̈** in addition to **cᶜ̧ pᵚ** and **gᵞ** where the superscript symbols have equivalent full-size modifier letters available in Unicode. For instance, the Q Keyboard supports **Ç Cedilla**, but does not define a *superscript* Ç Cedilla. And, attempting to add a regular combining accent to a superscript symbol generally will not work. Unlike IPA, APN cannot be composed with Unicode alone (as with a simple text editor).

Assuming that you are using a word processor such as Microsoft Word, the additional superscript-like symbols not directly defined on the Q Keyboard can be produced by first typing them as regular-size characters, including any added diacritics. Then, **highlight** the superscript part of the symbol and change it to a "superscript font format". That can by done clicking on a menu item like *Format* → *Font* → *Superscript*, by using a key sequence such as **Ctrl Numpad +** or with a similar action on your particular word processor. Testing has shown that starting with a **Capital** letter for the part being given the superscript font attribute (where available and appropriate) tends to produce better results.

By using this technique, all APN symbols can be typed or composed on the Q Keyboard.

Examples:

- **cÇ** → **cÇ** → **cᶜ̧**
- **ḍẒ** → **ḍẒ** → **ḍᶻ**
- **pẄ** → **pẄ** → **pᵂ̈**

<u>About key placement of phonetic symbols</u>

The various letters and symbols used phonetic purposes were assigned to key locations as best as could be done. As always, the priority in this keyboard design is to support the letters of contemporary Latin-based languages, and to consider larger language groups in providing the most benefit to the most people. While phonetic symbols are an important part of the keyboard, they are necessarily a secondary priority. Because of that, the symbols below may not always be in easy-to-remember locations. Persons such as linguists, scholars and university students in language programs will make heavier use of these characters and should learn quickly most of the assigned locations. Those who need these symbols only occasionally will doubtless have to frequently refer back to these tables.

<u>Phonetic symbol Live Key Guide</u>

The following table shows every phonetic symbol available as **Live Keys**.

In a few cases, the same symbol is available as a **Live Key**, and also as a **Dead Key** or ***Held Key***.

When the ˑ Upstep and ˓ Downstep arrows are not available for a given font, the standard arrows ↑ and ↓ can be used as substitutes.

Live Key	Symbol	U+	Phonetic Description
BL `	ə	0259	Mid-central unrounded vowel
BL 4	ʒ	0292	VD Postalveolar fricative
CL 0	ø	00F8	Close-mid front rounded vowel
AB =	ʉ	0289	Close-central rounded vowel
AB `	ɨ	0268	Close-central unrounded vowel
CL Q	æ	00E6	Raised-open front unrounded vowel
CL P	œ	0153	Open-mid front rounded vowel
AC]	ˈ	02BC	Ejective diacritic
BL D	ð	00F0	VD Dental fricative
AB ;	ɓ	0253	VD Bilabial implosive
AB '	ɗ	0257	VD Dental/alveolar implosive
CL X	ɣ	0263	VD Velar fricative
BL C	ç	00E7	VD Palatal fricative
BL V	ɔ	0254	Open-mid back rounded vowel
AB B	ɲ	0272	VD Palatal nasal
BL B	ŋ	014B	VD Velar nasal
BC M	↘	2198	Global fall
BC <	↑	2191	Upstep (substitution)
BC >	↓	2193	Downstep (substitution)
AB /	↗	2197	Global rise
BL /	ʔ	0294	VL Glottal plosive

<u>Phonetic symbol Dead Key Guide</u>

The following table shows every phonetic symbol available as **Dead Keys** and ***Held Keys***. This make it convenient to find these symbols all in one place instead of having to search the entire Dead Key Guide to locate them. Other characters on the same keys that are not phonetic-related are grayed-out.

The symbols on ***Held Keys*** 1 to 5 of **Dead Key 0B** (–) are **Modifier Letter Tone Bars**. These are used for phonetic descriptions of tone-based languages. There are additional symbols,

known as **Contour Tones**, that describe *transitions* from one tone to another. To obtain these, simply type two Tone Bars next to each other. Unicode-compliant text editors and word processors will automatically merge them together. Because of that, you do not need separate keys for each possible combination of tones. For instance, if you type the Tone Bars ˧ and ˩ together they will be merged into a ˨˩˦ contour. This combines tone 3 with tone 5 to make contour 35. Most software will allow up to 3 Tone Bars to be merged; Microsoft Notepad and NotePad++ will merge several.

U+AB5C Modifier Letter Small Heng on **AL ` H** may not appear in the Help display.

QWERTY Keys		AA Dead Key Symbols				*AA Held Key Symbols*			
LC key	UC key	AL u+	AL sym	AU U+	AU SYM	AL u+	AL sym	AU U+	AU SYM
Dead Key 00 ` ~									
`	~	0316	̖			0300	̀		
r	R	027B	˛			1DCA	̠		
g	G	0264	ɤ			1EA7	ầ	1EA6	Ầ
h	H	02B1	ʱ			AB5C	ꭜ	2302	⌂
;	:	0340	̀						
'	"					1DC8	ᾶ		
Dead Key 01 1 !									
1	!	0330	̰			0303	̃	0360	͠
r	R	027C	ɾ			027A	ɺ		
g	G	02E0	ˠ			1EAB	ẫ	1EAA	Ẫ
Dead Key 02 2 @									
`	~					0342	͂		
1	!					033E	;		
2	@	0334	̴			0330	̰		
e	E	1E1B	ḛ	1E1A	Ḛ	0258	ɘ	2C7B	ⱻ
r	R	1D72	ᵣ			02B5	ʵ		
o	O	0275	ɵ	019F	Ɵ				
l	L	026B	ɫ	2C62	Ɫ	AB38	ꭸ		
Dead Key 03 3 #									
3	#	030B	̋			030F	̏		

g	G	1D77	ɡ						
h	H	0267	ɧ			2500	─	2550	═
l	L	2C61	ⱡ	2C60	Ⱡ	FB02	ﬂ	FB04	ﬄ
b	B	025E	ɞ			029A	ɚ		
m	M	0270	ɱ			2E3B	3 Em Dash		

Dead Key 04 4 $									
3	#	03F6	ϵ			03F5	ϵ		
4	$	00A4	¤			0344	̈		
0	)	03D5	ϕ			1D60	ᵠ		
u	U	03B8	θ	0398	Θ	1DBF	ᵡ		
d	D	03B4	δ	0394	Δ	1E9F	ẟ		
f	F	03C6	ϕ	03A6	Φ	1DB2	ᵝ		
g	G	03B3	γ	0393	Γ	1D5E	ᵞ		
l	L	03BB	λ	039B	Λ	019B	ƛ		
x	X	03C7	χ	03A7	Χ	1D61	ᵡ		
b	B	03B2	β	0392	Β	03D0	ϐ		

Dead Key 06 6 ^									
6	^	032D	̭			0302	̂	1DCD	͡
8	*	0359	̙			20F0	⃰		
-	_	0349	̉			031A	̚		
r	R	1D19	ʁ			02B4	ʴ		
]	}	2423	␣			02FD	˽		
,	<	2E34	⸴			A71B	ꜛ		
.	>	2E33	⸳			A71C	ꜜ		

Dead Key 07 7 &									
`	~					1D95	ᵨ		
3	#	1D9A	ʒ			1D94	ʒ		
4	$	02AE	ɥ			02AF	ɥ		
r	R	027E	ɾ			027F	ɿ		
t	T					0288	ʈ	01AE	Ʈ
a	A	1EA3	ả	1EA2	Ả	1D8F	ᶏ		

s	S	1D98	ʃ			0282	ʂ		
d	D					1D91	ɖ		
f	F	AB34	ɝ			1EC3	ể	1EC2	Ể
l	L	A78E	ɬ			026D	ɭ		
z	Z	0225	ʐ	0224	Ʒ	0290	ʑ		
n	N					0273	ɳ	1DAF	ᵰ

Dead Key 08 8 *									
`	~	025A	ɚ			025D	ɝ		
7	&					033B	̪		
8	*	0325	̥			030A	̊		
9	(	A76F	ꝯ	A76E	Ꝯ	0351	̑	031C	̜
0	)	A74F	ꝏ	A74E	Ꝏ	0357	̗	0339	̩
-	_					0320	̠		
=	+					031F	̟		
y	Y	1E99	ʸ			02A7	ʧ		
j	J	02A4	ʤ			026E	ɮ		
k	K	02A6	ʦ			02AA	ɬˢ		
l	L	1EFB	ỻ	1EFA	Ỻ	AB39	ɬʰ		
z	Z	02A5	ʥ			0291	ɮ		
x	X	02A3	ʣ			02AB	ɬˡ		
c	C	02A8	ʨ			0255	ɕ		
v	V	A769	ꝿ	A768	Ꝿ	2C74	ⱴ		
b	B	048D	ҍ	048C	Ҍ	0238	ɓ		
n	N	0235	ȵ			AB3B	ɲ		
m	M					AB3A	ɱ		

Dead Key 09 9 (									
`	~					2094	ₐ		
5	%	0296	ʖ			01BE	ƾ		
9	(	032F	̯			0311	̑	0361	͡
0	)	0298	ʘ			032B	̫		
w	W					02AC	ʷ		
[	{	02C1	ˁ			02AD	ʭ		

]	}	02C0	ˀ						
\	|	02E4	ˁ						
c	C					0297	ʗ		
n	N					2099	ₙ	1D51	ᵑ
,	<	0295	˕			02A2	ʢ		
.	>	0294	˔			02A1	ʡ		
/	?	0242	ɢ			0241	ʔ		

Dead Key 0A 0)									
9	(					033C	̼		
0	)	032E	̮	035C	͜	0306	̆	035D	͝
=	+	1DCB	᷋			2295		229C	
q	Q	1E9A	ᶏ						
w	W	028D	ʍ						
e	E	0115	ĕ	0114	Ĕ	1D93	ᶓ	0364	ᵉ
r	R	0279	ɹ	1D1A	ʀ	1D89	ᵣ	036C	ʳ
t	T	0287	ʇ	A7B1	ᴚ	01AB	ᵵ	036D	ᵗ
y	Y	028E	ʎ			045E	ў	040E	Ў
p	P					1D88	ᵽ		
[	{	0319	̙			031E	̞		
]	}	0318	̘			031D	̝		
a	A	0103	ă	0102	Ă	1D90	ᵃ	0363	ᵃ
s	S	1D8B	ʃ			1D8A	ˢ		
d	D					1D81	ᵈ	0369	ᵈ
f	F					1D82	ᶠ		
g	G	011F	ğ	011E	Ğ	1D83	ᵍ		
h	H	1E2B	ḫ	1E2A	Ḫ	A795	ʰ	036A	ʰ
k	K	029E	ʞ	A7B0	Ʞ	1D84	ᵏ		
l	L	A781	ɭ	A780	Ɫ	1D85	ˡ		
z	Z	01AA	ʐ			1D8E	ᶻ		
x	X					1D8D	ˣ	036F	ˣ

c	C					A794	ꞅ	0368	ᶜ̊
v	V					1D8C	ᵥ̊	036E	ᵛ̊
b	B					1D80	ᵇ̊		
n	N					1D87	ⁿ̊		
m	M					1D86	ᵐ̊	036B	ᵐ̊

Dead Key 0B - _									
1	!					02E5	˥	2460	①
2	@	01BB	ƛ			02E6	˦	2461	②
3	#	21B0				02E7	˧	2462	③
4	$	21B1				02E8	˨	2463	④
5	%	21B2				02E9	˩	2464	⑤
-	_	0332	o̲			0305	ō	2E17	⸗
=	+	2010	-			2010	-	A78A	
e	E	AB33	ɘ			2C78	ⱸ		
u	U	0289	ʉ	0244	Ʊ	1D7E	ᵾ	1D7F	ᵿ
i	I	0268	ɨ	0197	Ɨ	1D7C	ᵢ		
o	O	0275	ɵ	019F	Ɵ	A74B	ꝋ	A74A	Ꝋ
\	|					1DC6	ȍ		
h	H	0127	ħ	0126	Ħ	2015	―		
j	J	0249	ɟ	0248	Ɉ	025F	ʝ		
l	L	019A	ɬ	023D	Ł	A749	ꝇ	A748	Ꝇ
;	:	02C8	ˈ			02CC	ˌ		
'	"	030D	ȯ			0329	ọ		
/	?	21A8				1DC4	ȱ		

Dead Key 0C = +									
6	^					A69D	ᵇ	246F	⑯
9	(					035E	ō	2472	⑲
0	)	1DCC	ȫ			035F	o̲	2469	⑩
-	_	0335	o̶			0336	o̸		
=	+	0331	ọ			0304	ō	02C9	ˉ
[	{	22A2	⊢			22A4	⊤		
]	}	22A3	⊣			22A5	⊥		

h	H	1E96	ẖ	0048	H	1D78	ᴴ		
'	"	030E	ȍ			0348	͉		
b	B	1E07	ḇ	1E06	Ḇ	A69C	ᵇ	2136	

Dead Key 1A [{									
[	{	0302	ô			032D	̭		
]	}	0346	ȏ			20E9	⃩		
\	|	032A	̪						
;	:					02BD	ʽ		
'	"					02BB	ʻ		

Dead Key 1B] }									
]	}	032C	̬			030C	̌		
\	|	033A	̺			09F2	৲		
;	:					02EE	ˮ		
'	"					02BC	'		

Dead Key 1C \ |									
-	_	2340	⍀			1DC5	̕		
\	|	20E5	⃥	20D2	⃒	0323	̣	20E6	⃦
x	X	0353	̓			0515	ԕ	0514	Ԕ

Dead Key 29 ; :									
3	#	205D	⁝			20DB	⃛		
4	$	205E	⁞			20DC	⃜		
l	L	026C	ɬ	A7AD	Ɬ	019A	ƚ	023D	Ł
;	:	0324	̤			0308	̈		
,	<	1DFE	̞			0354	̔		
.	>	0350	̠			0355	̕		

Dead Key 2A ' "									
`	~	244A	⑊			1DC9	̃		
r	R	0155	ŕ	0154	Ŕ	02B6	ʶ		
[	{	A78C	ꞌ			A78C	ꞌ		

]	}	A78B				A78B			
;	:	0341	ó			00B4	´	02CF	ˏ
'	"	0317	o̗			0301	o'	02CA	ˊ
,	<	02F1	˂			02F0	ˆ		
.	>	02F2	˃			02EF	ˇ		

Dead Key 31 X									
1	!	01C3	!						
3	#	025C	ɜ	A7AB	Ɜ				
4	$	0265	ɥ	A78D	Ɥ				
=	+	01C2	ǂ						
q	Q	024B	ɋ	024A	Ɋ	A7AF	ꝗ	1D01	Ꭿ
r	R	027D	ɽ	2C64	Ⱦ	0280	ʀ	0281	ʁ
y	Y	01B4	ƴ	01B3	Ƴ	028F	ʏ		
u	U	028A	ʊ	01B1	Ʊ	1D1C	ᴜ		
i	I	0269	ɪ	0196	Ɩ	026A	ɪ	A7AE	Ɪ
o	O	0254	ɔ	0186	Ɔ	1D0F	ᴏ		
p	P	01A5	ƥ	01A4	Ƥ	1D18	ᴘ	0276	ɶ
\	|	01C0	ǀ			2195	↕		
a	A	0251	ɑ	2C6D	Ⱬ	1D00	ᴀ		
s	S	0283	ʃ	01A9	Σ	A731	ꜱ		
d	D	0257	ɗ	018A	Ɗ	1D05	ᴅ		
g	G	0260	ɠ	0193	Ɠ	0262	ɢ	029B	ᵷ
h	H	0266	ɦ	A7AA	Ɦ	029C	ʜ		
j	J	029D	ɟ	A7B2	ɟ	1D0A	ᴊ		
l	L	026C	ɬ	A7AD	Ɬ	029F	ʟ		
;	:	02D0	ː						
'	"	02D1	ˑ						
x	X	0259	ə	018F	Ə	00D7	×	02DF	˗
v	V	028B	ʋ	01B2	Ʋ	1D20	ᴠ		
b	B	0253	ɓ	0181	Ɓ	0299	ʙ		
n	N	0272	ɲ	019D	Ɲ	0274	ɴ	1DAE	ᶮ
m	M	0271	ɱ	2C6E	Ɱ	1D0D	ᴍ	1DAC	ᶬ

/	?	01C1	ǁ			00F7	÷		

Dead Key 36 M									
`	~	02F4	ˋ			1D4A	ᵊ		
-	_	02ED	˭			033F	̿		
=	+	2017	‗			0333	̳	0347	͇
q	Q	0252	ɒ	2C70	Ɒ	1D45	ᵃ		
w	W	0195	ƕ	01F6	Ƕ	02B7	ʷ	1D42	ᵂ
e	E	01DD	ə	018E	Ǝ	1D49	ᵉ	1D31	ᴱ
r	R	211E	℞	211E	℞	02B3	ʳ	1D3F	ᴿ
t	T					1D57	ᵗ	1D40	ᵀ
y	Y	1EFF	ỿ	1EFE	Ỿ	02B8	ʸ		
u	U	00B5	µ			1D58	ᵘ	1D41	ᵁ
i	I	1D7B	ᵻ	0197	Ɨ	2071	ⁱ	1D35	ᴵ
o	O	2126	Ω			1D52	ᵒ	1D3C	ᴼ
p	P	220F	∏			1D56	ᵖ	1D3E	ᴾ
[	{	22B7				1D4B	ᵋ		
]	}	22B6				1D53	ᵓ		
\	|	22B8				1D9F	ᶟ		
a	A	0250	ɐ	2C6F	Ⱬ	1D43	ᵃ	1D2C	ᴬ
s	S	2211	∑			02E2	ˢ		
d	D	0256	ɖ	0189	Ɖ	1D48	ᵈ	1D30	ᴰ
f	F	0278	ɸ			1DA0	ᶠ	AB35	ꬵ
g	G	0261	ɡ	A7AC	Ɡ	1D4D	ᵍ	1D33	ᴳ
h	H	A727	ɧ	A726	ɧ	02B0	ʰ	1D34	ᴴ
j	J	0284	ʝ			02B2	ʲ	1D36	ᴶ
k	K					1D4F	ᵏ	1D37	ᴷ
l	L					02E1	ˡ	1D38	ᴸ
;	:	A789	꞉						
'	"	02B9	′			02BA	″		
z	Z	01BA	ʒ			1DBB	ᶻ		
x	X	AB53	χ	A7B3	Ꭓ	02E3	ˣ		
c	C	A73F	ɔ	A73E	Ɔ	1D9C	ᶜ		
v	V	028C	ʌ	0245	Ʌ	1D5B	ᵛ	2C7D	ⱽ

b	B	A7B5	β	A7B4	Β	1D47	ᵇ	1D2E	ᴮ
n	N	019E	ƞ	0220	Ƞ	207F	ⁿ	1D3A	ᴺ
m	M	026F	ɯ	019C	Ɯ	1D50	ᵐ	1D39	ᴹ
,	<	02C2	<			02C4	˄		
.	>	02C3	>			02C5	˅		

Dead Key 37 , <									
6	^					0312	ȯ̓		
7	&					0315	ȯ̕		
8	*					0314	ȯ̔		
9	(	239B				0313	ȯ̓		
r	R	0157	ŗ	0156	Ŗ	02DE	˞		
j	J					0321	ȩ		
l	L	013C	ļ	013B	Ļ	0322	ȩ		
c	C	00E7	ç	00C7	Ç	1E09	ḉ	1E08	Ḉ
m	M					031B	ơ		
,	<	0326	ȩ			0327	ȩ	226A	≪
.	>	2026	…			02BB	ʻ		

Dead Key 38 . >									
6	^					A71A	˩		
9	(	239D				0352	ȯ̂		
0	)	23A0				0310	ȯ̑		
-	_	22EF	⋯			A719	˸	2238	∸
\	|	22EE	⋮	22F1	⋱	A717	ˡ		
j	J	0237	ȷ	0248	ɟ	025F	ɟ		
,	<	02BC	'			02BB	ʻ	2E32	‚
.	>	0323	ȩ			0307	ȯ	226B	≫
/	?	2271		22F0	⋰	A718	˺	0358	ȯ

Dead Key 39 / ?									
-	_	233F	≠			1DC7	ȱ		
o	O	00F8	ø	00D8	Ø	01FF	ǿ	01FE	Ǿ
[	{	2223				02D5	˵		

]	}	2225				02D4	˟		
z	Z	035B	͡			200B	ZW Sp		
x	X	033D	̽						
/	?	0337	̸			0338	̸	2E2E	⸮

Phonetic symbol cross-reference

The following table provides the key sequences for each phonetic symbol, sorted in order by their phonetic description, rather than their Unicode value or Unicode description. This should be of benefit to linguists needing to find a particular symbol using terms they are familiar with.

The abbreviations "vd" and "vl" refer to "voiced" and "voiceless" (unvoiced) respectively.

The white and blue backgrounds below are intended to help readability, and have no other meaning.

The information in this table was based on the web site of John Wells:
http://www.phon.ucl.ac.uk/home/wells/ipa-unicode.htm
email: j.wells@ucl.ac.uk

Key	Sym	U+	IPA Description
HELD AL 8 =	̪	031F	advanced
DEAD AL 0]	̘	0318	advanced tongue root
DEAD AL X =	ǂ	01C2	alveolar click
DEAD AL X /	ǁ	01C1	alveolar lateral click
DEAD AL]]	̪	033A	apical
HELD AL M H	ʰ	02B0	aspirated
LIVE AB .	→	2192	becomes, is realized as; not IPA
DEAD AL 9 0	ʘ	0298	bilabial click
DEAD AL ; ;	̤	0324	breathy voiced
DEAD AL ` H	ʱ	02B1	breathy-voice-aspirated
HELD AL ; ;	̈	0308	centralized
DEAD AL M M	ɯ	026F	close back unrounded

LIVE AB =	ʉ	0289	close central rounded
DEAD AL - I	ɨ	0268	close central unrounded
DEAD AL ` G	ɤ	0264	close-mid back unrounded
HELD AL 2 E	ə	0258	close-mid schwa
HELD AL 2 2	b̰ a̰	0330	creaky voiced
DEAD AL [[	t̪ d̪	032A	dental
DEAD AL X \	ǀ	01C0	dental click
HEAD AL 6 .		A71C	down step (preferred)
LIVE BC .	↓	2193	down step (substitute)
LIVE AC]	'	02BC	ejective
DEAD AL 3 3	ȅ	030B	extra high tone
HELD AL 3 3	ȅ	030F	extra low tone
HELD AL 0 0	ĕ	0306	extra-short
LIVE CL 0	ø	00F8	front close-mid rounded
HELD AU X P	ɶ	0276	front open rounded
LIVE CL P	œ	0153	front open-mid rounded
LIVE BC M	↘	2198	global fall
LIVE AB /	↗	2197	global rise
LIVE BL /	ʔ	0294	glottal plosive
DEAD AL X '	ˑ	02D1	half-length
HELD AL ' '	e'	0301	high tone
HELD AL M W	ʷ	02B7	labialized
DEAD AL X 4	ɥ	0265	labial-palatal approximant
HELD AL 8 7	t̪ d̪	033B	laminal
DEAD AL X U	ʊ	028A	lax close back rounded
HELD AL X Y	ʏ	028F	lax close front rounded
HELD AL X I	ɪ	026A	lax close front unrounded
LIVE AC ;	ː	02D0	length mark

HELD AU 8 9	ɔ̹	031C	less rounded
HELD AL 0 9	t̪ d̪	033C	linguolabial
HELD AL ` `	e	0300	low tone
HELD AL 0 [	e̞ β̞	031E	lowered
HELD AL = =	ē	0304	mid tone
DEAD AL / X	ĕ	033D	mid-centralized
HELD AU 8 0	ɔ̽	0339	more rounded
HELD AL 1 1	e	0303	nasalized
DEAD AL 9 9	e̯	032F	non-syllabic
HELD AL 6 -	t̚	031A	not audibly released
DEAD AL M Q	ɒ	0252	open back rounded
DEAD AL X A	ɑ	0251	open back unrounded
LIVE BL V	ɔ	0254	open-mid back rounded
DEAD AL M V	ʌ	028C	open-mid back unrounded
DEAD AL X 3	ɜ	025C	open-mid central
DEAD AL 3 B	ɞ	025E	open-mid central rounded
LIVE BL 2	ɛ	025B	open-mid front unrounded
DEAD AL M A	ɐ	0250	open-mid schwa
HELD AL M J	ʲ	02B2	palatalized
DEAD AL 9 \	ˤ	02E4	pharyngealized
HELD AL 0]	e̝ ɹ̝	031D	raised
LIVE CL Q	æ	00E6	raised open front unrounded
HELD AL 8 -	e̠	0320	retracted
DEAD AL 0 [	e̙	0319	retracted tongue root
DEAD AL X 1	!	01C3	retroflex click
HELD AL 6 R	˞	02B4	rhotacized
HELD AL , R	ˠ	02DE	rhotacized
HELD AL 8 `	ɜ˞	025D	rhotacized open-mid central

DEAD AL 8 `	ɚ	025A	rhotacized schwa
LIVE AB 0	ɵ	0275	rounded schwa
LIVE BL `~	ə	0259	schwa
DEAD AL X X	ə	0259	schwa
HELD AL - ;	ˌ	02CC	secondary stress
DEAD AL - ;	ˈ	02C8	stress mark, primary
HELD AL - '	m̩ n̩ l̩	0329	syllabic
HELD AU 9 9	x͡	0361	tie bar above
DEAD AU 0 0	w͜	035C	tie bar below
HELD AL 6 ,		A71B	up step (preferred)
LIVE BC ,	↑	2191	up step (substitute)
DEAD AL 0 R	ɹ	0279	vd (post)alveolar approximant
LIVE AB '	ɗ	0257	vd alveolar implosive
HELD AL 1 R	ɺ	027A	vd alveolar lateral flap
HELD AL 8 J	ɮ	026E	vd alveolar lateral fricative
DEAD AL 7 R	ɾ	027E	vd alveolar tap
HELD AL 8 Z	ʑ	0291	vd alveolopalatal fricative
DEAD AL 4 B	β	03B2	vd bilabial fricative
LIVE AB ;	ɓ	0253	vd bilabial implosive
HELD AL X B	ʙ	0299	vd bilabial trill
LIVE BL D	ð	00F0	vd dental fricative
HELD AL 9 ,	ʕ	02A2	vd epiglottal fricative
HELD AL 9 .	ʔ	02A1	vd epiglottal plosive
DEAD AL X H	ɦ	0266	vd glottal fricative
DEAD AL X V	ʋ	028B	vd labiodental approximant
DEAD AL X M	ɱ	0271	vd labiodental nasal
DEAD AL X J	ʝ	029D	vd palatal fricative
DEAD AL M J	ɟ	0284	vd palatal implosive

DEAD AL 0 Y	ʎ	028E	vd palatal lateral
LIVE AB B	ɲ	0272	vd palatal nasal
HELD AL - J	ɟ	025F	vd palatal plosive
HELD AL . J	ɟ	025F	vd palatal plosive
DEAD AL 9 ,	ʕ	0295	vd pharyngeal fricative
DEAD AL 8 J	ʤ	02A4	vd postalveolar affricate
LIVE BL 4	ʒ	0292	vd postalveolar fricative
DEAD AL ` R	ɻ	027B	vd retroflex approximant
DEAD AL X R	ɽ	027D	vd retroflex flap
HELD AL 7 Z	ʐ	0290	vd retroflex fricative
HELD AL 7 L	ɭ	026D	vd retroflex lateral
HELD AL 7 N	ɳ	0273	vd retroflex nasal
DEAD AL M D	ɖ	0256	vd retroflex plosive
HELD AU X R	ʁ	0281	vd uvular fricative
HELD AU X G	ɠ	029B	vd uvular implosive
HELD AL X N	ɴ	0274	vd uvular nasal
HELD AL X G	ɢ	0262	vd uvular plosive
HELD AL X R	ʀ	0280	vd uvular trill
LIVE CL X	ɣ	0263	vd velar fricative
DEAD AL X G	ɠ	0260	vd velar implosive
HELD AL X L	ʟ	029F	vd velar lateral
LIVE BL B	ŋ	014B	vd velar nasal
DEAD AL M G	g	0261	vd velar plosive
DEAD AL 3 M	ɰ	0270	velar approximant
DEAD AL 1 G	ˠ	02E0	velarized
DEAD AU 2 2	˥ʕ	0334	velarized or pharyngealized
DEAD AL 2 L	ɫ	026B	velarized vd alveolar lateral
DEAD AL X L	ɬ	026C	vl alveolar lateral fricative

HELD AL 8 C	ɕ	0255	vl alveolopalatal fricative
DEAD AL M F	ɸ	0278	vl bilabial fricative
DEAD AL 4 U	θ	03B8	vl dental fricative
HELD AL X H	ʜ	029C	vl epiglottal fricative
DEAD AL 0 W	ʍ	028D	vl labial-velar fricative
DEAD AL 3 H	ɧ	0267	vl multiple-place fricative
LIVE BL C	ç	00E7	vl palatal fricative
LIVE AB H	ħ	0127	vl pharyngeal fricative
HELD AL 8 Y	ʧ	02A7	vl postalveolar affricate
DEAD AL X S	ʃ	0283	vl postalveolar fricative
HELD AL 7 S	ʂ	0282	vl retroflex fricative
HELD AL 7 T	ʈ	0288	vl retroflex plosive
DEAD AL 4 X	χ	03C7	vl uvular fricative
DEAD AL]]	s̬ t̬	032C	voiced
DEAD AL 7 V	ⱱ	2C71	voiced labiodental flap
DEAD AL 8 8	n̥ d̥	0325	voiceless
HELD AL 8 8	ŋ̊	030A	voiceless (ring above)

See Understanding modifier key notation for an explanation of modifier codes.

Quotes and related symbols

In addition to the standard ASCII ' and " quotes and ` grave accent mark, the Q Keyboard supports a number of quotation marks, quotation-like symbols and related characters. Some of these may be referred to as "word-processing quotes" because the matching open/closed symbols are typically used in word processors, which may automatically convert simple quotes into matching open/closed forms.

To identify specific word-processing quote types, it is common to compare them to commas or to the digits 6 and 9, because of the resemblance to the shapes of these characters. So, quotes like **“** and **”** may be called "66 quotes" and "99 quotes".

A helpful article about international quotation mark usage can found here:
https://en.wikipedia.org/wiki/Quotation_mark

The Q Keyboard supports all of the quotation marks discussed in that article, except those intended for Asian (CJK) scripts.

You can use the quote characters described here when your software does not perform such automatic conversions for you, or when you need precise control over how various quotations appear. This may be useful for entering data into a simple text editor or into a non-word-processor application.

Be sure to test the font you are using to ensure any specialized quote characters display correctly. Not all quotes are present in every font.

Notes:

- If you are running a word processor such as Microsoft Word, and you use any of the first eight **Live Key** quotes shown in the table below, be aware that for your quotes to come out right, you may have to disable any automatic quote correction. In Microsoft Word, you will find a setting under **Tools → Autocorrect Options → AutoFormat As You Type → Replace as you type**. If you see an entry like ☒ **"Straight quotes" with "smart quotes"** enabled, you must clear the checkbox. Various releases of this product, and other word processors, may handle this somewhat differently. The main point is that you may have to disable smart quotes to prevent the quote characters you type from getting altered.

- The **digraph** quotes on shifted **CU <** and **CU >** can be used in languages like French that surround their **« »** double-angle quotes with non-breaking spaces. When these extra spaces are not needed, the angle quotes on unshifted **CL <** and **CL >** should be used. **In the table** below, the non-breaking space is *represented* by a **Middle Dot** · to identify its location, where the space follows the opening **«** quote and precedes the closing **»** quote. It is just a documentation convention. A Middle Dot is **not** actually produced

when you type these keys.

- Likewise, the **digraph** quotes on shifted **AC <** and **AC >** can be used when **Narrow** non-breaking spaces are needed next to Guillemet quotes. Because the Narrow non-braking space is present in fewer fonts than is the regular Non-braking space, care is needed to ensure your documents will appear and print correctly.

- The other digraphs on **BC [** and **BC]** have **En Dash** and **Em Dash**, respectively, followed by a non-breaking space. This style is used to introduce quoted text in several European languages, and for quotations that appear in literary dialogs and theatrical scripts. Like the **« »** quotes noted above, the Middle Dot · shown in the table is a documentation convention and is **not** produced when you type these dashes.

- Corresponding digraph support for the single-angle quotes **‹ ›** with non-breaking spaces was not provided. Most languages that use the double-angle quotes **« »** do not use the single-angle ones, and those that do use the single-angle quotes tend to use them infrequently, and rarely incorporate spacing next to them. (See the Wikipedia article mentioned above.) If you have a need for single-angle quotes with adjacent non-breaking spaces, you will have to enter these manually. See Spacing and joining symbols for more information.

- The key assignments for the various quote types contain some redundancies. This was done to help users who might prefer or better remember one key sequence over another.

- The single right quote on **Live Key BL ,** (comma) is a convenience key for a punctuation often used in French.

- The **Modifier Letter Turned Comma** is a punctuation used in Hawaiian and elsewhere. See Polynesian languages for more information.

- The Prime symbol and the **Modifier** Prime symbol may or may not be easy to distinguish from each other, and from other actual quotation marks, depending on the font used. The same comments apply to Double Prime and **Modifier** Double Prime. If you have documents that contain Prime symbols and quotation marks that are adjacent, you should consider displaying them in different fonts.

- The last four symbols in the list (Reversed Comma, Double Low-Reversed-9 Quotation Mark, Raised Comma and Turned Comma) are present in few fonts. Note that Dead Key 6 (**AL ^**) has other "raised" symbols. See Key 06 for details.

  Note that "**Turned Comma**" is rare, but "**Modifier Letter Turned Comma**" on **Live Key AC [** and elsewhere on the keyboard is commonly available. Be careful not to confuse these similar names.

- Quote styles vary considerably by font, and opening and closing quotes are not always

easy to tell apart. For instance, Calibri quotes are **“ ”** and Segoe UI quotes are ″ ″ while Times New Roman has quotes with pronounced curvatures **“ ”** that are much more distinct. The table below uses Times New Roman to make clear which quote is which.

- The "**Saltillo**" symbols are quotation-like marks used as glottal stop indicators for some languages in Mexico and elsewhere. A Wikipedia article on these symbols can be found here.

Some Asian languages use **tall angle brackets** as quotes. If you want to use non-Asian characters that resemble these, either for quotation marks or other purposes, there are angle-bracket math symbols on Key `00 you may wish to use. These appear below, using Dejavu Sans font. There are similar-looking Angle Brackets as Miscellaneous Technical symbols on Key 03, shown in Segoe UI Symbol font; these have limited font availability.

Live Key	U+	Sym	Description
CL [	2018	‘	Left Single Quotation Mark
CU [	201C	“	Left Double Quotation Mark
CL]	2019	’	Right Single Quotation Mark
CU]	201D	”	Right Double Quotation Mark
CL ;	201A	‚	Single Low-9 Quotation Mark
CU ;	201E	„	Double Low-9 Quotation Mark
CL '	201B	‛	Single High-Reversed-9 Quotation Mark
CU '	201F	‟	Double High-Reversed-9 Quotation Mark
CL <	00AB	«	Left-Pointing Double Angle Quotation Mark
CL >	00BB	»	Right-Pointing Double Angle Quotation Mark
AB [	2039	‹	Left-Pointing Single Angle Quotation Mark
AB]	203A	›	Right-Pointing Single Angle Quotation Mark
CU <	---	« ·	« angle quote plus NBSP (shown as · dot) as a digraph
CU >	---	· »	NBSP plus » angle quote as a digraph
AC <	---	« ·	« angle quote plus *NNBSP* *(shown as · dot)* as a digraph
AC >	---	· »	*NNBSP* plus » angle quote as a digraph
BC [	---	– ·	En Dash plus NBSP as a digraph
BC]	---	— ·	Em Dash plus NBSP as a digraph

BL ,	2019	’	Right Single Quotation Mark
AC `	00B4	´	Acute Accent
AL ' space	02CA	ˊ	Modifier Letter Acute Accent
AL ` space	02CB	ˋ	Modifier Letter Grave Accent
AC [	02BB	ʻ	Modifier Letter Turned Comma
AC]	02BC	'	Modifier Letter Apostrophe
AC '	02BD	ʽ	Modifier Letter Reversed Comma
AC G	2032	′	Prime
AC H	2033	″	Double Prime
ABC [	2032	′	Prime
BCU [	2035	‵	Reversed Prime
ABC]	2033	″	Double Prime
BCU]	2036	‶	Reversed Double Prime
ABC \	2034	‴	Triple Prime
BCU \	2037	‷	Reversed Triple Prime
Dead Key or *Held Key*	U+	Sym	Description
AL 1 '	2032	′	Prime
AL 2 '	2033	″	Double Prime
AL 3 '	2034	‴	Triple Prime
AL 4 '	2057		Quadruple Prime
AL ` <	27E8	⟨	Mathematical Left Angle Bracket
AL ` >	27E9	⟩	Mathematical Right Angle Bracket
AL ` <	27EA	⟪	Mathematical Left Double Angle Bracket
AL ` >	27EB	⟫	Mathematical Right Double Angle Bracket
AL 3 <	2329	〈	Left-Pointing Angle Bracket
AL 3 >	232A	〉	Right-Pointing Angle Bracket
AL , ,	02BB	ʻ	Modifier Letter Turned Comma
AL ['	02BB	ʻ	Modifier Letter Turned Comma

AL [;	02BD	˽	Modifier Letter Reversed Comma
AL] '	02BC	'	Modifier Letter Apostrophe
AL] ;	02EE	ˮ	Modifier Letter Double Apostrophe
AL ' [	A78C	ꞌ	Latin Small Letter Saltillo
AL ' [	A78C	ꞌ	Latin Small Letter Saltillo
AL ']	A78B	Ꞌ	Latin Capital Letter Saltillo
AL ']	A78B	Ꞌ	Latin Capital Letter Saltillo
AL ' ;	00B4	´	Acute Accent
AL – ;	02C8	ˈ	Modifier Letter Vertical Line
AL – ;	02CC	ˌ	Modifier Letter Vertical Low Line
AL M '	02B9	′	Modifier Letter Prime
AL M '	02BA	″	Modifier Letter Double Prime
AL . '	2E41	⸁	Reversed Comma
AL . '	2E42	⸂	Double Low-Reversed-9 Quotation Mark
Al . ,	2E32	‚	Turned Comma - *not a Modifier Letter*
AL ^ ,	2E34	⸔	Raised Comma

See Understanding modifier key notation for an explanation of modifier codes.

Script capitals

The Q Keyboard supports typing of **Script Capitals**, using ***Held Key AU [*** which requires Shift.

The 9 characters in the table are the only script capitals defined in Unicode. As with other less-frequently used symbols, you need to test your font to confirm it has the letters you need. Script capitals are not well-represented in many fonts, and often only Script Capital M is present. The table below uses DejaVu Sans for the symbols, as it has the complete set.

Script Capitals are often used as math symbols. The commonly-understood math operations are shown in the table. Since math symbols can be used for more than one purpose, you should confirm that the symbols you select are appropriate for your purposes. Operations noted for I and R are believed correct but are subject to revision.

Note that **U+2118** is defined in Unicode as **Script Capital P**, but in nearly all fonts it is rendered as if it were a lower-case **p**. The only font found where the symbol actually looks like Capital **P** was in **SymbolA**, where is appears as ℘ instead of ℘ in DejaVu Sans.

The **Script M** symbol ℳ at **U+2133** on ***Held AU [M*** was previously used for the **German Mark** until replaced by the Euro. This is the only Held Key currency symbol on the Q Keyboard that requires the use of **Shift**. Technically, Unicode does not consider ℳ to be a currency sign, but merely a "Letter-like symbol".

Held Key	Sym	U+	Math operation
AU [B	ℬ	212C	Bernoulli function
AU [E	ℰ	2130	Electromotive force
AU [F	ℱ	2131	Fourier transform
AU [H	ℋ	210B	Hamiltonian operator
AU [I	ℐ	2110	Imaginary
AU [L	ℒ	2112	Laplace transform
AU [M	ℳ	2133	M-matrix
AU [P	℘	2118	Weierstrass elliptic function
AU [R	ℛ	211B	Real, or Riemann integral

See Capitalization rules for a discussion of upper-case Held Key characters.

See Understanding modifier key notation for an explanation of modifier codes.

Small capitals

The Q Keyboard supports typing of **Small Capitals**, using ***Held Key AA X*** (shown as ***AL X*** below). A few Small Capitals require ***Held Key AA+Shift X*** (shown as ***AU X*** below); these are specialty Small Capital symbols other than **A**-**Z**. There are also Small Capitals on ***AL /***, **AL -** and **AL **

The Unicode Standard implements **most** of the letters **A**-**Z** as Small Capitals. As with other less-frequently used symbols, you need to test your font to confirm it has the letters you need.

Consult Key X 31: Extra and the other keys noted above for a complete list of all supported Small Capital letters.

The following points should be noted:

- Small Capitals for **S** and **F** are present in few fonts. **Update:** As of February 2019, the most recent version of Roman Cyrillic Std font has both of these letters.

- Currently, there is no Small Capital for **X** in the Unicode Standard. Instead, this key will produce **ə** and **Ə** when used as a **Dead Key**. See Key X 31: Extra for more information.

  Testing suggests that if a **Small Capital X** existed, most fonts would render it the same as a common Latin Small Letter X. If you needed a Small Capital X, you could try using that, or you could also try a lower-case Cyrillic X which is on **AL W X**. The difficulty in distinguishing a Latin Small Letter X from a Small Capital X may explain why one has not been defined. Similar remarks apply to the seldom-available Small Capital S, Latin Small Letter S, and U+0455 Cyrillic Small Letter Dze on AL W S which also resembles the letter S.

- Small Capital **Q** has been added to Unicode as **U+A7AF**. It is part of Unicode version 11, released in June 2018. The symbol that appears in the Dead Key guide for Dead Key X is an approximation. You **can** use ***Held Key AL X Q*** now, and the correct Unicode value will be produced, but until updated font support is available, you will only see an undefined symbol like this: □. (The new **Latin Letter U with Slash Stroke** on Dead Key / 39 has a similar issue.)

- The symbols **ᴁ** and **ᴂ** are on ***AU X Q*** and ***AU X P*** in order to be consistent with **Æ** and **Œ** on **CC Q** and **CC P**

Specialty small capital symbols, produced with ***Held Keys***

Held Key	**Symbol**	**Description**

AL X S	ꜱ	**Latin Letter Small Capital S**
AL X Q	ǫ	**Latin Letter Small Capital Q - available in Unicode 11**
AU X Q	ᴁ	**Latin Letter Small Capital AE**
AU X P	ᴂ	**Latin Letter Small Capital OE**
AU 2 E	ᴈ	**Latin Letter Small Capital Turned E**
AL – B	ƀ	**Latin Letter Small Capital Barred B**
AL – D	ᵭ	**Latin Letter Small Capital Eth**
AL / L	ꝇ	**Latin Letter Small Capital L with Stroke**
AL \ C	ᴐ	**Latin Letter Small Capital Open O**
AL \ N	ᴎ	**Latin Letter Small Capital Reversed N**

Example:

The Small Capital ᴇ is on ***AL X E***

- hold the **AA** key
- type **X**
- type **E**; the ᴇ symbol appears
- release the **AA** key

Example:

The Small Capital ᴁ is on ***AU X Q***

- hold the **AA**+Shift keys
- type **X**
- type **Q**; the ᴁ symbol appears
- release the **AA** and Shift keys

See Understanding modifier key notation for an explanation of modifier codes.

Spacing and joining symbols

Many international keyboards use the Spacebar in conjunction with **AltGr** for the Non-Breaking Space, and sometimes for the **Narrow** Non-Breaking Space as well. That is the approach taken by the German T2 keyboard and others.

However, **the Q Keyboard never changes the behavior of the Spacebar**. When you press the Spacebar, every possible combination of the Shift key and/or the **AA**, **BB** and **CC** modifiers that may be in effect will always result in an ordinary Space being produced. You never have to worry about accidentally typing a Non-Breaking Space or other special-purpose character. It will always be just Space. This makes it convenient to insert spaces in the middle of some text while holding down one of the special Q Keyboard modifier keys. You can do that without having to release those modifier keys just to insert a Space.

The Q Keyboard also does not alter its handling of the Spacebar when Ctrl or Alt is held, either. The "data value" of the Spacebar will still be a Space, although your applications may treat such key sequences in a special way.

A review of many standard keyboard layouts in Windows revealed that while all have **Ctrl+Spacebar** defined as a space, none have **Ctrl+Shift+Spacebar** defined (not even as a Non-breaking Space). A number of software packages use this key sequence for special purposes, by detecting its scan codes, even though there is no 'character value' associated with it. In order to carefully maintain software compatibility and conform to prevailing usage, the Q Keyboard also leaves the key sequence **Ctrl+Shift+Spacebar** undefined, rather than equating it to space.

You can use the accent/tilde key to quickly enter Non-Breaking spaces as **Live Keys**.

Note: See Quotes and related symbols for quotation marks having integrated non-breaking spaces.

Live Key spacing symbols available with **CL CU** and **AC** modifiers

Live Key	U+	Symbol	Description
CL `	00A0	NBSP	Non-Breaking Space
CU `	202F	NNBSP	Narrow Non-Breaking Space
AC \	200C	ZWNJ	Zero Width Non Joiner

For the space symbols, the Non-Breaking Space has priority over the **Narrow** Non-Breaking Space, by virtue of the fact that **NBSP** does not require Shift to be held, so it is easier to type. This was done in spite of the fact that some languages might prefer use of the **NNBSP** in formal writing and in composition guides for their language, such as

when next to certain types of punctuation.

The reason it was designed this way is that in a number of fonts and software applications, support exists for representing and processing a **NBSP** but not for the **Narrow** one. Also, **NBSP** is present in about 10 times as many fonts as **NNBSP**. So, priority is given to the spacing symbol that is most likely to be present and work correctly in the most environments, since a choice has to be made between the two. The issue of software application support is important. Testing revealed that even when NNBSP is present in a font, some software will not process it correctly. This flaw typically results in NNBSP acting like an **ordinary** space by failing to prevent "breaks" from occurring.

It was because of these issues that some Live Key **digraphs** on the Q Keyboard that might have otherwise used a **Narrow** non-breaking space don't use it. This includes the special Euro symbol on CU 4 that has an integrated (*regular*) NBSP. In particular, **French** usage prefers the narrow form, and it would have been nice to freely use NNBSP on this, but poor font availability makes that impractical. The design must support all users, not just French typists, and even they would have had problems with so many fonts not containing NNBSP.

When typing NNBSP, it may be easier to hold the right Shift key with the right hand, and type the **CC**+*grave* with the left hand, rather than trying to do everything on the left side or using other techniques.

The **Zero Width Non Joiner ZWNJ U+200C** symbol on **Live Key AC ** is present as an assist to users familiar with the German T2 keyboard. Because the German language often has long compound words, it is especially important for German speakers to have fine control over where a word can be broken. For similar reasons, the T2 keyboard also has a Soft Hyphen key (**SHY**), which the Q Keyboard supports on **Live Key AB –**

See Dashes and hyphens for more information.

For other space characters, the Q Keyboard makes these available as ***Held Keys*** using ***AL /*** plus a key. (The **En Quad** and **Em Quad** space characters are available as ***Held Keys*** using ***AL .*** plus a key.) As with all Held Keys, you must keep **AA** pressed until the final key is typed to get the correct result. These spacing characters do not use Shift, and so the ***AA*** key is shown as ***AL*** below.

Convenience Non-breaking and Narrow Non-Breaking spaces

Some typists may prefer to use a Dead Key sequence for these spaces, especially if the text being typed includes other Dead Key letters. To accommodate this, you are allowed to use **AA X Space** for **U+00A0 Non-breaking space** and **AA M Space** for **U+202F Narrow Non-breaking space**. You would normally not hold Shift when typing these, but they will work the same whether Shift is held down or not. These Convenience spaces are typed like

Literal symbols are, using the Spacebar, but technically they are not Literals. We are using these locations because **AA X** and **AA M** have no Literals of their own. For the same reasons applicable to Literals, once you type **AA X** or **AA M**, it doesn't matter whether or not you continue to hold **AA** when typing the Spacebar.

To remember which is which, you may notice that the **M** in **AA M Space** for **NNBSP** is next to key **N**. That will help associate **M** with **N**, and **N** with the **Narrow** in **N**NBSP.

See the article Bidirectional text for a discussion of this feature on the Q Keyboard. These control codes may be considered as "spacing symbols".

Notes:

- The various space characters are assigned using a mnemonic approach to help you remember which key has which symbol, so that an **Em Space** is on **M**, **Thin Space** is on **T**, and so on. This follows the mnemonic approach also used in dash symbols like **Em Dash**.

- The **joiner** symbols are on punctuation keys that are near the **/** slash key, to help make them easy to type.

- The **Zero Width Non-Joiner** is on the **period key**, both to make it an easy to type ***Held Key***, and to be consistent with the German T2 keyboard, which uses **AltGr** + *period* for this purpose. For users preferring a Live Key, **ZWNJ** is also present on **AC **

- Some of these specialized spaces may not exist in all fonts, though most of them should be. If any of these are not present, you may see an empty-square or question-mark-like symbol. Be sure to test your font for the spacing symbols you plan to use.

  It's not like the font designers had to create **glyphs** for these blank characters. They don't, since there aren't any. But they do have to define these code-point entries and fill them in with font attribute information, which includes whether they have a 'non-breaking' attribute and whether the size of the spaces can be adjusted or not when line-justification is being performed. These are not difficult tasks for an experienced font designer, but someone actually has to sit down and do it, and not all fonts do this for every one of these spacing characters.

  Some fonts may have special spacing symbols in their normal font but not in a related one such as bold or italic. For instance, **Calibri** has **U+2060 Word Joiner** in its normal font, but not in bold. If you run into this issue, your only options are to change the presentation (normal instead of bold), change the font itself, or do without the special symbol. You might be able to substitute a non-breaking space or non-breaking hyphen for an unavailable Word Joiner, depending on your document.

- Note that spacing symbols **En Quad** and **Em Quad** are on ***AL .*** instead of ***AL /*** in order to keep the mnemonic use of **N** and **M**.

- Since spacing and joining symbols have no glyphs, and some do not consume visible space, it may not be apparent if you have typed the wrong one. If you are using Microsoft Word, you can type **Alt X** immediately to the right of any character and it will be converted to its four-digit Unicode value. If you find you have typed the wrong symbol, delete the hex digits and enter your correction. If you typed the right one, you can type **Alt X** again and the hex digits will be converted back to the symbol.

  When using **Alt X**, be sure to use the real **Alt** key and not the **AA** key. **AA X** is the Dead Key for "Extra" characters. For currently supported Q Keyboard devices, the real **Alt** key is on the right side, and the Alt mapped as **AA** is on the left side.

- Note that if your spacing symbol had a character of **0**-**9** or **A**-**F** just preceding it, reconverting the hex digits with **Alt X** back to your original symbol may not work correctly. If this happens, temporarily precede the first digit with a non-digit character like **/**, use **Alt X** to convert the value, then go back and delete the temporary **/** character. Or, perform an **Undo** word-processor function to back out what the original **Alt X** did. **Alt X** may also not work if a specialty space character is part of a larger span of regular spaces; MS Word may simply ignore it. To get around that, you can temporarily put some non-blanks like / on both sides of the special space, attempt **Alt X** again, then remove the / characters afterwards.

  The text editor **BabelPad** displays the Unicode value of the character to the right of the cursor. This is convenient if you want to test a key sequence without doing **Alt X** all the time. This software is produced by the same group that developed BabelMap.

  Their web site may be found at
  http://www.babelstone.co.uk/Software/BabelPad.html.
  Software is periodically updated, so be sure to check if you have the most current version.

- Since the spacing symbols are ***Held Keys***, you should be mindful of the issues discussed in the article Issues with Held Keys and N-Key Rollover. For instance, the **Zero Width Non-Joiner** ***Held Key*** requires that you type the slash key and then the period key while holding down **AA**. Since these two keys are next to each other, it's easy to type them very quickly. Depending on your keyboard's design, if you do this **too** quickly, the possibility exists that you may get an incorrect result. If that occurs, **slow down** your typing speed and try again. For most devices, you should not run into problems, but if you do, you can use the **Live Key** version on **AC ** instead.

- The following codes are non-visible spacing-like "formatting symbols", though technically they are not spaces *per se:*

Held AU / L **U+2028** Line Separator
Held AU / P **U+2029** Paragraph Separator

- Unicode joining symbols may not be implemented by all **software**, even if your **font** defines them. If you plan on using any of these symbols, be sure to confirm that your intended software recognizes them; some may not. If you are using some software that was released at time when an earlier version of the Unicode standard was in effect, it may or may not recognize or properly handle symbols from later versions of Unicode.

- Information on relative sizes was taken from https://www.cs.tut.fi/~jkorpela/chars/spaces.html

Held Key	U+	Description	Relative Size, where Em Space = 1.0
AL / N	2002	En Space	.50 = 1/2 Em = 1 En
AL / M	2003	Em Space	1.0 = 1 Em
AL . N	2000	En Quad	.50 = 1/2 Em = 1 En
AL . M	2001	Em Quad	1.0 = 1 Em
AL / 3	2004	Three-Per-Em Space	.33 = 1/3 Em
AL / 4	2005	Four-Per-Em Space	.25 = 1/4 Em
AL / 5	205F	Medium Mathematical Space	.22 = 4/18 Em = 2/9 Em
AL / 6	2006	Six-Per-Em Space	.16 = 1/6 Em
AL / F	2007	Figure Space	Average width of a digit
AL / P	2008	Punctuation Space	Width of a period "."
AL / T	2009	Thin Space	.20 = 1/5 Em or .16 = 1/6 Em
AL / H	200A	Hair Space	< .20 or smaller than Thin Space
AL / Z	200B	Zero Width Space	0
AL / W	2060	Word Joiner †	0
AL / .	200C	Zero Width Non-Joiner	0
AL / ,	200D	Zero Width Joiner †	0
AL / C	034F	Combining Grapheme Joiner ‡	0
AL / ;	00A0	Non-Breaking Space	.25 = 1/4 Em = size of regular Space
AL / '	202F	Narrow Non-Breaking Space	< .25 or smaller than NB Space

Dead Key	U+	Description	Relative Size, where Em Space = 1.0
AA X SP	00A0	Non-Breaking Space	.25 = 1/4 Em = size of regular Space

AL / ;	**00A0**	**Non-Breaking Space**	
AA M SP	**202F**	**Narrow Non-Breaking Space**	**< .25 or smaller than NB Space**
AL / '	**202F**	**Narrow Non-Breaking Space**	

† If you wanted to "join" characters together to prevent them from being split across lines, similar to how a non-breaking space or non-breaking hyphen is handled, you can try using either the **Word Joiner** or the **Zero Width Joiner**. You will have to test this with your software to confirm that it works for you. Various software may not support these joining symbols consistently.

‡ Note that the **Combining Grapheme Joiner** has a misleading Unicode name. ***It does not join graphemes***, but has a very technical purpose that is rarely required by most users.

See https://en.wikipedia.org/wiki/Combining_Grapheme_Joiner for more information on this topic.

See Understanding modifier key notation for an explanation of modifier codes.

Superscripts and subscripts

The Q Keyboard supports a full set of superscript and subscript symbols. These include the digits 0-9, the punctuation symbols **( ) - + =** and certain alphabetic forms.

The common superscripts for **1 2** and **3** can also be typed as **Live Keys**. This feature is present to be compatible with other international keyboards that often make these superscripts available.

Font support for superscript and subscript numerics is surprisingly uneven. Some fonts have both types, some may just have superscripts, and some may have none at all. (Until recently, Times New Roman had none.) Several were found that only had superscript **4**, and a few fonts have superscripts that strangely omit digits **5**, **6** and/or **9**.

> The author is mystified by that last point, and would appreciate it if any users of the Q Keyboard knew of an explanation for this.

Be sure to test the fonts you intend to use.

Superscript symbols produced with **CC+Shift** modifier

Live Key	Symbol	Description
CU 1	¹	Superscript 1
CU 2	²	Superscript 2
CU 3	³	Superscript 3

Superscript and subscript symbols are handled by three different keys:

- **AA [** is used for **superscript numerics** and the punctuation **– = ( ) +**
- **AA]** is used for **subscript numerics** and the punctuation **– = ( ) +**
- **Held Key *AA 9*** is used for **alphabetic** superscripts and subscripts

For convenience, the numeric and punctuation symbols can be typed **either** as **Dead Keys** or as ***Held Keys***. In the key definitions, these characters are duplicated, so you can use whichever typing method is easier. It is expected that for typing long strings of superscript/subscript characters, you would type them as Held Keys, and for a single symbol, you would type it as a Dead Key.

Superscript and subscript punctuation **( )** and **+** require Shift, just as the ordinary characters **( ) +** do. The remaining symbols do not use Shift. For **Dead Key** symbols requiring Shift (shown as **AU** below), you can use Early Shift or Late Shift, whichever you prefer. When typed as ***Held Keys***, symbols using Shift require the Shift key to be held

through the entire key sequence (a Full Shift). See Capitalization rules for more information.

Dead Key/ ***Held Key***	Sym	Description
AL [1	¹	**Superscript 1**
AL [2	²	**Superscript 2**
AL [3	³	**Superscript 3**
AL [4	⁴	**Superscript 4**
AL [5	⁵	**Superscript 5**
AL [6	⁶	**Superscript 6**
AL [7	⁷	**Superscript 7**
AL [8	⁸	**Superscript 8**
AL [9	⁹	**Superscript 9**
AL [0	⁰	**Superscript 0**
AL [-	⁻	**Superscript -**
AL [=	⁼	**Superscript =**
AU [9	⁽	**Superscript (**
AU [0	⁾	**Superscript)**
AU [=	⁺	**Superscript +**
AL [/	⁄	**Fraction Slash ***
Dead Key/ ***Held Key***	Sym	Description
AL] 1	₁	**Subscript 1**
AL] 2	₂	**Subscript 2**
AL] 3	₃	**Subscript 3**
AL] 4	₄	**Subscript 4**
AL] 5	₅	**Subscript 5**
AL] 6	₆	**Subscript 6**
AL] 7	₇	**Subscript 7**
AL] 8	₈	**Subscript 8**
AL] 9	₉	**Subscript 9**
AL] 0	₀	**Subscript 0**
AL] -	₋	**Subscript -**
AL] =	₌	**Subscript =**
AU] 9	₍	**Subscript (**

AU] 0	₎	**Subscript)**
AU] =	₊	**Subscript +**
AL] /	⁄	**Fraction Slash** *

* The next section contains information on the use of the **Fraction Slash**.

Alphabetic superscripts and subscripts produced with ***AL 9 Held Key*** and **AL 9 Dead Key**

Unicode provides **partial** support for alphabetic superscripts and subscripts. These symbols can be useful if you want to insert a mathematical expression like $\mathbf{2^n}$ or $\mathbf{A_i}$ into your document Most of these letters are typed using the unshifted ***AL 9 Held Key.*** A small number of these are typed using the shifted ***AU 9 Held Key*** or as unshifted **AL 9 Dead Key**. Consult the Dead Key guide for Key 09 for a complete list of available alphabetic superscript and subscript symbols.

> Unicode does not define a character called "**Modifier Letter Small N**" but does have a "**Superscript Latin Small Letter N**". Because it is desirable for the Modifier Key M be as complete as possible, this symbol is on Dead Key M, serving in the role of a substitute Modifier Letter Small N. So, to type something like $\mathbf{2^n}$ you would use ***Held AL M N*** rather than something on Key 9.

If you need additional **superscript** letters that Unicode does not directly provide, you may be able to substitute a Modifier Letter for this purpose. Modifier letters are available in both upper and lower case, and there is a more complete set of them. They are generally the same size and location as the superscript alphabetic forms.

There are no Modifier Letters on ***AA M*** that correspond to **subscript** alphabetics. However, if you need **upper-case subscript** alphabetics, you may be able to substitute a Small Capital letter.

See Key X 31: Extra for a complete list of the available Small Capital letters on ***AA X.***

In addition to having limited Unicode support, there are few fonts with a complete set of these glyphs. Fonts that do have them are Quivira, Roman Cyrillic Std, DejaVu Sans, Microsoft Sans Serif and Everson Mono. You will need to test the fonts you use to ensure the symbols you need are present. See Suggested fonts for more information.

Example: Type a **subscript** lower case **i** as ***Held Key AL 9 I***

- press and **continue to hold** the **AA** modifier key
- type the **9** key
- type the **I** key
- the subscript letter ᵢ appears
- release the **AA** key

Example: Type a **superscript** lower case **i** as ***Held Key AU 9 I***

- press and **continue to hold** the **AA**+Shift modifier keys
- type the **9** key
- type the **I** key
- the superscript letter ^{i} appears
- release the **AA** and Shift keys

See Understanding modifier key notation for an explanation of modifier codes.

Part 5: Language and keyboard guides

This section has sample guides for commonly used languages. It is not possible to include a specific example for every language you might be interested in, but the ones provided illustrate how the resources of the Q Keyboard can be applied to typing the letters you need.

Comparisons between the Q Keyboard and several international keyboards are also provided, to help you see how the Q Keyboard is fully capable of replacing these devices.

Apache and indigenous languages

The Q Keyboard fully supports the Apache language. The accented letters and special symbols used in Apache are shared by other indigenous languages.

> As of January 2019, it was confirmed that every Latin letter in every indigenous language documented at www.omniglot.com was supported on the Q Keyboard.

Acute letters **á Á é É í Í ó Ó ú Ú** are produced as Live Keys with **CC** plus the native letter.

Ogonek letters **ą Ą ę Ę ị Ị ǫ Ǫ ụ Ụ** are produced as Live Keys with **BB** plus the corresponding Southwest Vowel letters **G F J K H** respectively.

Letter **ł Ł** with Slash is on **AA L**

Some indigenous languages use the Caron letters **č Č** and **š Š** which are at **AA C** and **AA S**

Additionally, some languages use tone marks represented by Grave accents, Caron, Diaeresis, Dot Below. Macron, Ogonek and/or Circumflex. These are standard accents or common combining modifiers that are described elsewhere in this document.

Other letters you may encounter include **ə Ə ɨ ɨ ʉ Ʉ** and **ɣ Ɣ**. Many of these are available as Live Keys. The letter **ə Ə Schwa** is also on **Dead Key AA X X**. **U+019B ƛ Latin Small Letter Lambda with Stroke** is used in several languages, and resembles a Greek Lambda; it is on ***Held AL 4 L***. You may also need the **λ** Greek Lambda on **Dead AL 4 L**.

At times, you may see modifier letters such as **ᵒ** and **ʷ**. These and other such letters are described in more detail in the article Modifier letter guide. Some alphabets that have a **modifier O** may used the **° Degree** symbol as a substitute.

Sym	U+	Key
ə	0259	Live BL `
Ə	018F	Live BU `
ɨ	0268	Live AB ` • Dead AL – I
ɨ	0197	Live BC ` • Dead AU – I
ʉ	0289	Live AB = • Dead AL – U
Ʉ	0244	Live BC = • Dead AU – U
ɣ	0263	Live CL X
Ɣ	0194	Live CU X
ʔ	0294	Live BL /
λ	03BB	Dead AL 4 L
ƛ	019B	*Held AL 4 L*

ᵒ	1D52	*Held AL M O*
ʷ	02B7	*Held AL M W*
°	00B0	**Degree symbol on Live BL –**

When letters need to be **underlined**, these can be done using a Macron Below or Line Below combining modifier, or via Hyper Keys. If the letter you need has a **precomposed Macron or underline**, you will find it on Key 0C (the **=+** key). There are also the Macron vowels available as Northwest Vowel Live keys, which may be useful. Key 0C has the Macron and Macron Below combining modifiers, and Key 0B (the – key) has the **wider** Line Below and Overline combining modifiers, if you need them.

The apostrophe **'** is often used as a glottal stop symbol. Some orthographies may use the **’** Single Right Quotation Mark, available on **BL ,** (comma), instead of an apostrophe. It is possible you may see a few cases where **Modifier Letter Turned Comma ‘** is used. See Polynesian languages for more information on the use of Modifier Letter Turned Comma.

Sometimes a **Comma Above combining modifier** is used instead instead of an apostrophe. These are discussed under Key 37, which has the Cedilla dead key. See also Combining diacritics.

> If you have letters needing a Comma Above combining modifier but your font does not have this, it may be possible to substitute a **Dot Above** combining modifier, if your font has **that**, and if the substitution would be acceptable. In many fonts, Comma Above and Dot Above look very similar. To add a Dot Above to a letter, you would hold **AA** and type the period key **twice**. If you want to use **predefined** Dot Above letters like **ė** refer to Key . 38: Dot Above for more information.

A few languages describe their letters with the **U+02D0 Modifier Letter Triangular Colon** punctuation. Since this symbol resembles an ordinary colon, and it is present on few keyboards, most typists would just use a regular colon. Should you wish to type the special modifier colon, it is on **Dead AL X :** and on **Live AC :** if needed.

> Evidently, many indigenous orthographies arose from punctuation marks being manually typed over English letters on U.S. typewriters, because doing so was simple and that's what was available. This explains the prevalence of dash, underscore, apostrophe, colon and slash diacritics, and to a certain extent, commas and periods. Now that computers and improved fonts are commonplace, better and more readable approaches are possible, but orthographies change slowly.

You may also wish to consult Glottal, Click and special symbols for more information. A number of indigenous languages make use of special punctuation such as **! ǂ | ‖ ˑ ˈ** and the **ʔ** glottal stop. In some cases, you may see the digit **7** used as a substitute for the **ʔ** symbol. As noted, other than apostrophe and the **ʔ** symbol, the most common character used as a glottal stop is the **’** Single Right Quotation Mark on **Live Key BB ,** (comma). If the reversed **U+0295 ʕ** symbol is needed, it is on **Dead AL 9 ,** (comma).

For information about how the glottal stop is represented in various languages, see https://en.wikipedia.org/wiki/Glottal_stop#Writing.

Note: All the letters above can also be produced as conventional Dead Keys. Refer to the Dead Key Guide for more information. Most typists will likely prefer using Live Keys for these, since they are faster and require less effort.

Apache vowels can **combine the Ogonek and Acute accents**. To produce these, you would start with one of the accents (Acute or Ogonek) on a precomposed letter, and then add the other accent as a Combining Modifier.

The combining modifier for Ogonek is ***AL 5 5***
The combining modifier for Acute Accent is ***AL ' '***

Testing has shown that you will **usually get better results** by starting with vowels having a precomposed Ogonek first, and **then** adding an Acute to it, rather than the other way around. Combining Ogonek diacritics sometimes do not compose well, while the more-commonly used Combining Acute diacritics can usually be added without problems. For the same reasons, composing these vowels by starting with a plain letter and adding **both** accents to it will usually produce inferior results, it addition to requiring more typing effort.

The same principle applies to languages that use Ogonek vowels with Grave, Diaeresis or other accent. It will usually work best to start with the Ogonek letter and add the other accent afterwards. However, in some cases you will have no choice. For instance, the **Tłącho** language uses **dotless ı with Ogonek**, which has no precomposed form, so you must add an Ogonek to a regular dotless **ı** letter.

Whenever possible, it is **usually** best to use precomposed letters if they are available. However, you can occasionally run into trouble. For instance, some languages use an **i** with Ogonek and then **also** add an Acute accent. But in some fonts, the dot above the **i** does not get removed when the Acute is added, so the letter **i** ends up with both a dot **and** an acute accent, which doesn't look right. A well-designed font is supposed to remove the dot above an **i** or **j** when another accent is added, but they don't all do it. If this happens, the solution is to start with a **dotless ı** and add **both** accents separately, or else find a font that doesn't have this problem.

Here is an example of this problem in the **Tahoma** font, enlarged to show detail: **i̧'**

Here is the same font, starting with a dotless **ı** and adding two accents: **ı̨**

A final example, starting with a regular **i** but using **Gentium Plus**: **i̧'**

You can see that Gentium Plus did not have this problem; in most cases it behaves

correctly and does what you expect it to do. It's better to use a font that works properly, because if you have to add two accents separately, it means more work for you, and some languages might use these specially accented letters frequently - meaning a **lot** of extra work. The important thing to remember is that you must test your fonts.

Some languages may use the letter **y Y** with Ogonek. There is no precomposed letter for this. In testing, adding an Ogonek to upper-case **Y** performed poorly, and adding Ogonek to lower-case **y** performed ***very*** poorly; in many fonts, the combining Ogonek mark simply disappears. Letter **y Y** seldom takes accents below of any kind, and allowing an accent below on a letter with a descender is hard for font designers to get right. Two fonts where this worked somewhat well (but not great) were Doulos SIL and Gentium Plus.

The letter **y Y** with an Ogonek added is rendered **so** poorly in so many fonts that you may wish to use the precomposed Vietnamese letter **ỵ Ỵ with Dot Below** as a substitute. This is available as Dead Key **AA \ Y** • Since some indigenous languages also use Dot Below accents, this substitution may or may not be acceptable, depending on your requirements.

In some alphabets, the Ogonek letters preferred by native speakers of their language are not exactly the same as the ones used in Polish, but are Ogonek-***like*** letters, having a bottom hook with a slightly different shape or one that attaches to the letter differently. Because Unicode does not define such alternative Ogonek-***like*** letters, you would have to use the standard Ogonek vowels, and then choose a font that renders them as you prefer. Organizations that represent the interests of smaller language groups often develop fonts that better suit their purposes. An Internet search may turn up such font resources, should you need them.

Some font technologies allow for "tailoring" of how accents on letters are rendered. For instance, a font might vary the position and angle of the Acute accent, depending on what language it was being used in. A similar adaptation could be applied to Ogonek letters for indigenous languages. The main drawback to this is that support for such things must be added one font at a time, and tailoring fonts in this way requires in-depth knowledge of font design and is labor-intensive. It may be a challenge to find fonts where such technologies have been applied for the benefit of indigenous languages, since they have smaller populations of speakers.

Organizations that represent the interests of smaller language groups often provide keyboard layouts optimized for indigenous peoples. The Q Keyboard is competitive with many of these, but because some languages may have many letters requiring combining modifiers (sometimes with dual accents), and these keyboards implement them like "Live Key digraphs", they may be more efficient than the Q Keyboard in those specific cases. You would have to determine whether the Q Keyboard is suitable for your needs. The main advantage in using the Q Keyboard is that it can be applied to many international languages, not just to a specialized indigenous orthography.

See Quotes and related symbols for more information on available punctuation.

See Understanding modifier key notation for an explanation of modifier codes.

Belgian Linux keyboard

Support for Belgian Linux keyboard features

The Q Keyboard contains equivalent functionality for every feature present on the Belgian Linux keyboard. The following is a description of each its keys and how to obtain the same results on the Q Keyboard. A notation in ***red italic*** indicates a ***Held Key*** and **blue** indicates a **Live Key**.

A diagram of the Belgian Linux keyboard keyboard can be found here:
https://upload.wikimedia.org/wikipedia/commons/4/49/Belgian_Linux_keyboard.svg

You may observe a number of similarities in the key layouts of the Belgian Linux keyboard and the Canadian Multilingual keyboard in terms of the character repertoire. The Canadian keyboard is a modified QWERTY design, while the Belgian keyboard is AZERTY-based.

As can be seen from the keyboard diagram and the table below, this keyboard contains a number of redundant character locations. The references available are unclear whether these are all available at the same time, if they account for different physical keyboard hardware, or if they are present in different locations in different environments. For example, there are two different locations each for the characters **ł Ł ¢ ° § \ $** and **£**

Key	Belgian Linux Feature	Equivalent on Q Keyboard
Left of 1	Superscript ²	**CU 2** • see Superscripts and Subscripts
	Superscript ³	**CU 3** • see Superscripts and Subscripts
	Not sign ¬	**CL 6**
1	Inverted Exclamation ¡	**CL 1**
2	Letter **é**	**CC E** • **AA ' E**
	Fraction ⅛	**AB 8** • ***AL 1 8***
3	Pound Currency **£**	**CL 3**
4	Fraction ¼	**AB 4** • ***AL 1 4***
5	Fraction ½	**AB 2** and **BC 2** • ***AL 1 2***
	Fraction ⅜	**AB 9** • ***AL 3 8***
6	Fraction ⅝	**BC 9** • ***AL 5 8***
	Section mark **§**	**CL 8**

7	Fraction ⅞	**BC 8** • ***AL 7 8***
	Letter **è**	**BB E** • **AA ` E**
8	Trademark ™	**AC T**
9	Plus/minus ±	**CL =**
	Cedilla **ç**	**BB C** • **AA , C**
0	Degree °	**BL –**
	Letter **à**	**BB A** • **AA ` A**
Right of 0	Degree °	**BL –**
	Inverted Question **¿**	**CL /**
2nd Right of 0	Cedilla dead key	**AA ,**
	Ogonek dead key	**AA 5** • Ogonek letters are also on Southwest Vowel **Live Keys** using **BB**
A	Ohm sign **Ω**	**CU M** • Capital Omega **Ω** is on **AU 4 V**
Z	Letter **ł Ł** with Slash Stroke	**AA L** • **AA / L**
E	Euro sign **€**	**CL 4** • (NBSP+€) **CU 4** • ***AL [E***
	Cent sign **¢**	**CL 2**
R	Registered Trademark **®**	**AC X**
	Paragraph/Pilcrow **¶**	**CL 9**
T	T with Dash Stroke **ŧ Ŧ**	**CC T** • **AA – T**
Y	Yen **¥**	**CL 7**
	Arrow **←**	**AB <**
U	Arrow **↑**	**BC <**
	Arrow **↓**	**BC >**
I	Turkish **ı İ**	**AA J** • **AA . I**
	Arrow **→**	**AB >**
O	Ligature **œ Œ**	**CC P**

P	Letter Thorn **þ Þ**	**AB P** and **BC P**
Right of P	Circumflex dead key	**AA 6**
	Diaeresis dead key	**AA :**
	Ring Above dead key	**AA 8** **Ring letters åÅ ǎǍ and ůŮ available as Live Keys**
2nd Right of P	Macron dead key	**AA =** • Macron letters also on Northwest Vowel keys
Q	Ligature **æ Æ**	**CC Q**
S	Letter **ß ẞ**	**AB S** and **BC S**
	Section mark **§**	**CL 8**
D	Letter Eth **ð Ð**	**BB D**
F	Letter **đ Đ** with Dash Stroke	**CC D**
	Ordinal **ª**	**AC A**
G	Letter Eng **ŋ Ŋ**	**BB B**
H	Letter **ħ Ħ** with Dash Stroke	**AB H** and **BC H** • **AA – H**
K	Letter Kra **ĸ**	**AC K**
L	Letter **ł Ł** with Slash Stroke	**AA L** • **AA / L**
M	Acute dead key	**AA '**
	Double Acute dead key	**AA 3** Hungarian **ű Ű** and **ő Ő** also available on **Live Keys AA H** and **AA K**. Double Acute combining modifier is on ***Held AL 3 3***
Right of M	Caron dead key	**AA]**
	Acute dead key	**AA '**
	Letter **ù Ù**	**BB U** • **AA ` U**
2nd Right of M	Pound Currency **£**	**CL 3**
	Micro symbol **µ**	**CL M** • **Greek Mu µ** on **AL 4 M**
	Breve dead key	**AA 0** (zero)

	Grave dead key	**AA** `
W	Double left angle quote «	**CL <** • see Quotes and related symbols
X	Double right angle quote »	**CL >** • see Quotes and related symbols
C	Copyright ©	**AC C**
	Cent sign ¢	**CL 2**
V	6 quote ‘	**CL [** • see Quotes and related symbols
	66 quote “	**CU [** • see Quotes and related symbols
B	9 quote ’	**CL]** • see Quotes and related symbols
	99 quote ”	**CU]** • see Quotes and related symbols
Right of N	Ordinal º	**AC O**
	Cedilla dead key	**AA ,**
2nd Right of N	Multiply sign ×	**CU 8** or ***Held AL X X***
3rd Right of N	Divide sign ÷	**CU /**
	Middle dot ·	**CL –**
4th Right of N	Tilde dead key	**AA 1** • Tilde **ñ Ñ** also available as **CC N** • Other tildes for vowels **A E I O U Y** use **AB** and **BC** modifiers
	Dot Above dead key	**AA .**

See Quotes and related symbols for more information on available punctuation.

See Understanding modifier key notation for an explanation of modifier codes.

Berber and related languages

The Q Keyboard provides comprehensive support for Berber languages when using the Berber **Latin** alphabet.

The Berber group of languages goes by several names, depending on the dialect and region, and includes Amazigh, Kabyle, Riffian, Shawi, Souss, Tacawit, Tamahaq, Tamazight, Taqbaylit, Tarifit, Tashelhit and Tuareg. Berber languages are challenging to represent. They have symbols from Greek and African alphabets, Greek-inspired Latin letters, extensive use of combining diacritics, modifier letters, glottal symbols and special punctuation.

Further, because of French influences in the region, some types of Berber keyboards include bilingual support for French or incorporate a more extensive international keyboard layout. Implementations of Berber keyboards can be quite complex.

The Berber **Tifinagh** alphabet is not available, for the following reasons:

- Support for non-Latin scripts is generally outside the scope of what the Q Keyboard is designed for.

- Adding a large number of additional symbols would take up space needed for other purposes.

- Keyboards that have dual Latin/Tifinagh generally use the Caps Lock to select between the alternate sets of symbols. The Q Keyboard cannot do this, because it would interfere with other, non-Berber uses of the keyboard.

Berber uses a number of letters with Dot Below, including letters that have descenders like **j** and the letter **ḍ Ḍ** that already has a Line Below. Some fonts are known to truncate diacritics when they appear low on a line. You will have to carefully select and test the fonts you use, to ensure that you get the correct results. You may wish to try Gentium Plus, since it often (but not always) performs well with complex combining accents. You may encounter a similar issue with the letter **G with Line Below**, which must be typed as a composition; in some fonts the Line Below may get truncated for lower-case **g**. This issue affect how the article you are now reading will be formatted when you view it as a Help document. You will have to read the description field for each letter carefully, because the rendering of the accented letter may be misleading.

When some letters can be typed more than one way (via Live Key and Dead Key) the shortest key sequence is generally shown. Refer to the Dead Key Guide for Dead Key versions of letters shown below only as Live Key sequences. In particular, letters shown as using Hyper Keys with **ABC** and **BCU** can be typed with more conventional combining modifiers, if using Hyper Keys is more effort than you prefer.

Over the years, Berber keyboards have been designed in many different configurations. There does not appear to be a single, agreed-upon key arrangement among keyboard designers. Thus, rather than attempting to show a key-for-key correspondence between any specific Berber keyboard and the Q Keyboard, the following list categorizes in alphabetical order the letters and symbols appearing on many representative samples of Berber keyboards. You should find that the Q Keyboard provides the features you need. The list below was compiled from a number of reference sources, and represents multiple character repertoires used in different regions. No guarantee of completeness can be given. If you need a character that does not appear in the list, consult the Dead Key Guide and the Appendix to see all of the Q Keyboard's resources.

> The Q Keyboard is capable of producing all known Latin Berber letters. Because of the complexity of these orthographies, it may not be especially easy to type some Berber dialects. However, even native Berber keyboards are not always easy to use. If the various Berber language groups could somehow work together and coordinate their efforts, it ought to be possible to simplify these alphabets and create greater commonality between them. That would help foster better communication and improve literacy. The example of common alphabets adopted for African languages might serve as an example to emulate. Perhaps someday such a challenging effort will be attempted.

In the table below, if you see a "Key" specification on multiple lines, you must type all of it. For instance, D with Line Below and Dot Below is typed as **AU = D *AL* \ ** as the entire sequence, which appears in the table on two lines. Here, **AU = D** creates the base letter **D̲** with Line Below and ***AL* \ ** adds the Dot Below.

A notation in ***red italic*** indicates a ***Held Key*** and **blue** indicates a **Live Key**.

Consult these Help sections for common symbols:

- Greek letters
- Quotation marks
- Currency symbols
- Combining modifiers
- Dashes and hyphens
- Key 07 contains several Retroflex Hook letters, and Key 0A (0) has Palatal Hook letters
- Key 08 (*) is used for Ring and Half Ring modifiers

See also Convenience Keys for alternative key locations that may be of assistance.

	Sym	U+	Key	Sym	U+	Key	Description and Notes
A							
	â	**00E2**	**CL G**	**Â**	**00C2**	**CU G**	**A with Circumflex**

	à	00E0	BL A	À	00C0	BU A	A with Grave
	ă	0103	AL Q	Ă	0102	AU Q	A with Breve
	æ	00E6	CL Q	Æ	00C6	CU Q	AE ligature
	ɑ	0251	AL X A	Ɑ	2C6D	AU X A	Latin Alpha
	ª	00AA	AC A				Feminine ordinal
B							
	ḇ	1E07	AL = B	Ḇ	1E06	AU = B	B with Line Below
	ɓ	0253	AL X B	Ɓ	0181	AU X B	B with Hook also on AB ; and BC ;
C							
	ç	00E7	BL C	Ç	00C7	BU C	C with Cedilla
	č	010D	AL C	Č	010C	AU C	C with Caron
	ċ	010B	AB C	Ċ	010A	BC C	C with Dot Above
D							
	ḍ	1E0D	AL \ D	Ḍ	1E0C	AU \ D	D with Dot Below
	ɗ	0257	AL X D	Ɗ	018A	AU X D	D with Hook also on AB ' and BC '
	đ	0111	CL D	Đ	0110	CU D	D with Dash Stroke
	ð	00F0	BL D	Ð	00D0	BU D	Letter ETH
	ḏ	1E0F	AL = D	Ḏ	1E0E	AU = D	D with Line Below
	ḏ	1E0F 0323	AL = D *AL \ *	Ḏ	1E0E 0323	AU = D *AL \ *	D with Line Below and Dot Below
E							
	é	00E9	CL E	É	00C9	CU E	E with Acute
	ẹ́	00E9 0323	CL E *AL \ *	Ẹ́	00C9 0323	CU E *AL \ *	E with Acute and Dot Below
	è	00E8	BL E	È	00C8	BU E	E with Grave
	ẹ	1EB9	AL \ E	Ẹ	1EB8	AU \ E	E with Dot Below
	ə	01DD	AL M E	Ǝ	018E	AU M E	Reversed E
	ɛ	025B	BL 2	Ɛ	0190	BU 2	Open E
	ə	0259	BL `	Ə	018F	BU `	Schwa; also on Dead Key AA X X
F							

	ḟ	0066 0323	f *AL* \\	Ḟ	0046 0323	F *AL* \\	F with Dot Below
G							
	ǧ	01E7	BL]	Ǧ	01E6	BU]	G with Caron
	ġ	0121	BL \	Ġ	0120	BU \	G with Dot Above
	ǥ	01E5	AL – G	Ǥ	01E4	AU – G	G with Stroke also on **AA 5 G**
	ḡ	1E21	AL = G	Ḡ	1E20	AU = G	G with Line Above
	ḡ	0067 0332	g AL = –	Ḡ	0047 0332	G AL = –	G with Line Below ḡ on **ABC G** and Ḡ on **BCU G**
	ɣ	03B3	AL 4 G	Γ	0393	AU 4 G	Greek Gamma
	ɣ	0263	CL X	Ɣ	0194	CU X	Latin Gamma
H							
	ḥ	1E25	AL \ H	Ḥ	1E24	AU \ H	H with Dot Below
	ħ	0127	AB H	Ħ	0126	BC H	H with Dash Stroke
I							
	ị	1ECB	AL \ I	Ị	1ECA	AU \ I	I with Dot Below
	ɩ	0269	AL X I	Ɩ	0196	AU X I	Latin Iota
	ij	0133	AB J	IJ	0132	BC J	IJ Digraph
	íj	00ED 0237 0301	AB \	ÍJ	00CD 004A 0301	BC \	IJ Digraph with Acute I See Dutch IJ for more information about typing IJ with Acute.
J							
	ǰ	01F0	AL] J	J̌	004A 030C	AC J	J with Caron
	ȷ	006A 0323	j *AL* \ \	ȷ	004A 0323	J *AL* \ \	J with Dot Below
K							
	ḵ	1E35	AL = K	Ḵ	1E34	AU = K	K with Line Below
	ƙ	0199	AL X K	Ƙ	0198	AU X K	K with Hook
L							
	ḷ	1E37	AL \ L	Ḷ	1E36	AU \ L	L with Dot Below
	l·	0140	BL ;	L·	013F	BU ;	L with Middle Dot

	ɭ	026D	*AL 7 L*				L with Retroflex Hook
M							
	---	---					
N							
	ɲ	0272	AL X N	Ɲ	019D	AU X N	N with Left Hook also on AB B and BC B
	ŋ	014B	BL B	Ŋ	014A	BU B	Letter Eng also on BB B
	№	2116	AC 3				Number/Numero symbol
O							
	ô	00F4	CL K	Ô	00D4	CU K	O with Circumflex
	ɔ	0254	BL V	Ɔ	0186	BU V	Open O
	œ	0153	CL P	Œ	0152	CU P	OE ligature
	ᵒ	1D52	*AL M O*				Modifier letter O
	°	02DA	AL 8 Space				Ring Above literal symbol
	º	00BA	AC O				Masculine ordinal
P							
	¶	00B6	CL 9				Pilcrow/Paragraph mark
Q							
	---	---					
R							
	ř	0159	AL R	Ř	0158	AU R	R with Caron
	ṛ	1E5B	AL \ R	Ṛ	1E5A	AU \ R	R with Dot Below
	ɾ	027D	AL X R	Ɽ	2C64	AU X R	R with Tail
	ɾ	027E	AL 7 R				R with Fishhook
	ɹ	027F	*AL 7 R*				Reversed R with Fishhook
S							
	ṣ	1E63	AL \ S	Ṣ	1E62	AU \ S	S with Dot Below
	ʃ	0283	AL X S	Σ	01A9	AU X S	Latin Sigma
	σ	03C3	AL 4 S	Σ	03A3	AU 4 S	Greek Sigma; use *AL 4 S* for ς
	ß	00DF	AB S	ß	1E9E	BC S	German Eszett

	ſ	017F	AC S				German Long S
	§	00A7	CL 8				Section mark
T							
	ṭ	1E6D	AL \ T	Ṭ	1E6C	AU \ T	T with Dot Below
	ṯ	1E6F	AL = T	Ṯ	1E6E	AU = T	T with Line Below
	ţ	0163	AB T	Ţ	0162	BC T	T with Cedilla
	ƭ	01AD	AL X T	Ƭ	01AC	AU X T	T with Hook
U							
	û	00FB	CL H	Û	00DB	CU H	U with Circumflex
	ù	00F9	BL U	Ù	00D9	BU U	U with Grave
	ᵘ	1D58	*AL M U*				Modifier letter U
V							
	ʋ	028B	AL X V	Ʋ	01B2	AU X V	V with Hook
	ᵛ	1D5B	*AL M V*				Modifier letter V
W							
	ⱳ	2C73	AL X W	Ⱳ	2C72	AU X W	W with Hook
	ʷ	02B7	*AL M W*				Modifier letter W
X							
	---	---					
Y							
	ƴ	01B4	AL X Y	Ƴ	01B3	AU X Y	Y with Hook
	ʸ	02B8	*AL M Y*				Modifier letter Y
Z							
	ż	017C	BL Z	Ż	017B	BU Z	Z with Dot Above
	ẓ	1E93	AL \ Z	Ẓ	1E92	AU \ Z	Z with Dot Below
	ʒ	007A 0327	z *AL , ,*	Ʒ	005A 0327	Z *AL , ,*	Z with Cedilla
	ʒ	0292	BL 4	Ʒ	01B7	BU 4	Letter Ezh
Other symbols							
	̪	033A	AL] \				Combining Bridge Below
	·	00B7	CL –				Middle dot

	°	00B0	BL –				Degree mark
	-	2011	BU –				Non-breaking hyphen
	—	2015	*AL – H*				Horizontal bar; Quotation Dash
	¤	00A4	AC Y				Generic currency symbol, also on **AL 4 4**
	ʕ	0295	AL 9 <				Glottal symbol
	ʔ	0294	BL /				Glottal symbol, also on **AL 9 >**
	ˀ	0242	AL 9 /	ʔ	0241	*AL 9 /*	Glottal symbols
	ˁ	02C1	AL 9 [	ˀ	02C0	AL 9]	Glottal symbols
	¡	00A1	CL 1	¿	00BF	CL /	Inverted ! and ?
	£	00A3	CL 3	€	20AC	CL 4	Pound and Euro currencies
	…	2026	BL .				Ellipsis symbol
	¹	00B9	CU 1				Superscript 1
	²	00B2	CU 2				Superscript 2
	³	00B3	CU 3				Superscript 3
	µ	00B5	CL M				Micro sign
	o͡	0361	*AU 9 9*				Combining Inverted Double Breve
	o̅	0304	*AL = =*				Combining Macron
	o͞	035E	*AL = 9*				Combining Double Macron
	ZWNJ	200C	*AL / .*	ZWNJ	200C	AC \	Zero Width Non Joiner
	ZWJ	200D	*AL / ,*	ZWJ			Zero Width Joiner

See Understanding modifier key notation for an explanation of modifier codes.

Canadian Multilingual keyboard

Support for Canadian Multilingual keyboard features

The Q Keyboard contains equivalent functionality for every feature present on the Canadian Multilingual keyboard. The following is a description of each its keys and how to obtain the same results on the Q Keyboard. A notation in ***red italic*** indicates a ***Held Key*** and **blue** indicates a **Live Key**.

> **Note**: When the Canadian government designed this, they had several goals in mind. They wanted it to be a good international keyboard, capable of supporting French and as many indigenous languages as possible.
>
> A list of these languages can be found at https://en.wikipedia.org/wiki/Languages_of_Canada
>
> For all the languages in that list, where the language is not extinct, has sufficient documentation, and uses Latin letters defined in Unicode, the Q Keyboard is capable of typing all of them. Some of the orthographies used by these languages are complicated, and require one or more combining modifiers to be added; all of the accents required are available. It is possible the Q Keyboard could be used for other languages not on this list, but due to a lack of reference articles, that cannot be confirmed.

You may observe a number of similarities in the key layouts of the Belgian Linux keyboard and the Canadian Multilingual keyboard in terms of the character repertoire. The Canadian keyboard is a modified QWERTY design, while the Belgian keyboard is AZERTY-based.

Wikipedia has a diagram of this keyboard, which can be found here:

https://upload.wikimedia.org/wikipedia/commons/d/d0/KB_Canadian_Multilingual_Standard_comment-en.svg

> This diagram was not produced by the Canadian government, but is an image that was submitted to Wikipedia by a volunteer contributer. On letter **Q** of this diagram, you will notice two symbols that look like upper-case **Ω Omega** and lower-case **ω omega**. However, according to available references, the apparent upper-case **Ω Omega** is actually the **Ω Ohm** symbol, and the lower-case **ω omega** is not officially defined for the keyboard. The Capital Greek letter Omega is on **AU 4 V** • The Ohm symbol as shown below is on **CU M** •
>
> Based on available references, it is possible the author of this diagram intended for the **ω** symbol to be a Modifier Letter ʷ or ᵂ which is on ***Held Key AL M W*** or ***AU M W.*** It is also possible that features of the Belgian Linux keyboard were confused with the Canadian keyboard, since the Belgian keyboard has an Ohm or Omega symbol on its **A**

key.

Some indigenous languages make use of the Modifier Letter ʷ or ᵂ, a symbol not on the Canadian keyboard. That keyboard also lacks the three dot … Ellipsis symbol now favored on French keyboards. The Ellipsis is on **Live Key BL .** (period).

The keyboard has redundant definitions for the **Dot Above** dead key, which it also uses to produce a **Middle Dot** as a literal. These are located on the **Period** key and on the **é É** key to its right.

Key	Canadian Multilingual Feature	Equivalent on Q Keyboard
Spacebar	Non-breaking Space	**CL** ` and ***AL / '*** • see Spacing and joining symbols
1	Inverted Exclamation ¡	**CL 1**
	Superscript ¹	**CU 1** • see Superscripts and Subscripts
2	Superscript ²	**CU 2** • see Superscripts and Subscripts
3	Superscript ³	**CU 3** • see Superscripts and Subscripts
	Pound Currency **£**	**CL 3**
4	Fraction ¼	**AB 4** • ***AL 1 4***
	Euro sign **€**	**CL 4** • (NBSP+€) **CU 4** • ***AL [E***
	Generic currency ¤	**AC Y** • **AL 4 4**
5	Fraction ⅜	**AB 9** • ***AL 3 8***
	Fraction ½	**AB 2** • **BC 2** • ***AL 1 2***
6	Fraction ⅝	**BC 9** • ***AL 5 8***
	Fraction ¾	**BC 4** • ***AL 3 4***
7	Fraction ⅞	**BC 8** • ***AL 7 8***
8	Trademark ™	**AC T**
9	Plus/minus ±	**CL =**
- _	Inverted Question ¿	**CL /**
= +	Cedilla dead key	**AA ,**

	Ogonek dead key	**AA 5** • Ogonek letters also on Southwest Vowel Live Keys using **BB**
	Not sign ¬	**CL 6**
Q	Ohm symbol **Ω**	**CU M** • Greek Omega **Ω** is on **AU 4 V**
W	Letter **ł Ł** with Slash Stroke	**AA L** • **AA / L**
E	Euro sign **€**	**CL 4** • (NBSP+€) **CU 4** • ***AL [E***
	Ligature **œ Œ**	**CC P**
R	Registered Trademark ®	**AC X**
	Paragraph/Pilcrow ¶	**CL 9**
T	T with Dash Stroke **ŧ Ŧ**	**CC T** • **AA – T**
Y	Yen **¥**	**CL 7**
	Arrow ←	**AB <**
U	Arrow ↑	**BC <**
	Arrow ↓	**BC >**
I	Turkish **ı İ**	**AA J** • **AA . I**
	Arrow →	**AB >**
O	O with slash stroke **ø Ø**	**CC 0** (zero) • **AA / O**
P	Letter Thorn **þ Þ**	**AB P** and **BC P**
Right of P	Circumflex dead key	**AA 6**
	Diaeresis dead key	**AA :**
	Ring Above dead key	**AA 8** **Ring letters åÅ ǎǍ and ůŮ available as Live Keys**
	Grave dead key	**AA `**
2nd Right of P	Cedilla **ç Ç**	**BB C** and **AA , C**
	Macron dead key	**AA =** • Macron letters also on Northwest Vowel keys
	Tilde dead key	**AA 1** • Tilde **ñ Ñ** also available as **CC N** • Other tildes for vowels **A E I O U Y** use **AB** and **BC** modifiers

A	Ligature **æ Æ**	**CC Q**
S	Letter **ß ß**	**AB S** and **BC S**
	Section mark **§**	**CL 8**
D	Letter Eth **ð Ð**	**BB D** • **đ Đ** is on **CC D**
F	Ordinal **ª**	**AC A**
G	Letter Eng **ŋ Ŋ**	**BB B**
H	Letter **ħ Ħ** with Dash Stroke	**AB H** and **BC H** • **AA – H**
K	Letter Kra **ĸ**	**AC K**
L	Letter **l· L·** with Middle Dot	**BB L** • **AA . L** • Middle Dot · is on **CL –**
; :	Acute dead key	**AA '**
	Double Acute dead key	**AA 3** Hungarian **ű Ű** and **ő Ő** also available on **Live Keys AA H** and **AA K**. Double Acute combining modifier is on ***Held AL 3 3***
	Degree **°**	**BL –**
Right of **; :**	Caron dead key	**AA]**
	Letter **è È**	**BB E** • **AA ` E**
2nd Right of **; :**	Breve dead key	**AA 0**
	Letter **à À**	**BB A** • **AA ` A**
Left of Z	Broken vertical **¦**	**CL **
	Letter **ù Ù**	**BB U** • **AA ` U**
Z	Double left angle quote **«**	**CL <** • see Quotes and related symbols
X	Double right angle quote **»**	**CL >** • see Quotes and related symbols
C	Copyright **©**	**AC C**
	Cent sign **¢**	**CL 2**
V	6 quote **‘**	**CL [** • see Quotes and related symbols
	66 quote **“**	**CU [** • see Quotes and related symbols

B	9 quote ’	**CL]** • see Quotes and related symbols
	99 quote ”	**CU]** • see Quotes and related symbols
N	Musical Eighth note ♪	**AC M** • **BCU 8**
	Letter **’n** preceded by apostrophe	***AL , N*** • ***AL ' N***
M	Ordinal º	**AC O**
	Micro symbol **µ**	**CL M** • Greek Mu **µ** is on **AL 4 M**
Right of M	Multiply sign ×	**CU 8** or ***Held AL X X***
2nd Right of M	Divide sign ÷	**CU /**
(period key)	Dot Above dead key	**AA .**
	Middle dot ·	**CL –**
3rd Right of M	Letter **é É** with Acute	**CC E** • **AA ' E**
(é É key)	Dot Above dead key	**AA .**
	Middle dot ·	**CL –**

See Quotes and related symbols for more information on available punctuation.

See Understanding modifier key notation for an explanation of modifier codes.

Czech and Slovak

The Q Keyboard fully supports the Czech and Slovak languages. These languages have similar syntax and grammars, and similar though not identical alphabets, with Czech containing 42 letters (including digraph **CH**) and Slovak containing 46 (including digraphs **CH**, **DZ** and **DŽ**).

Acute letters **á Á é É í Í Í Ĺ ó Ó ŕ Ŕ ú Ú ý Ý** are produced as Live Keys with **CC** plus the native letter. (Letter **Í Ĺ** with Acute and letter **í Í** with Acute are specially highlighted to distinguish them.)

Caron letters **č Č ď Ď ň Ň ř Ř š Š ť Ť ž Ž** are produced as Live Keys with **AA** plus the native letter.

Letter **ä Ä** with Diaeresis is on **AA A**

The **dz Dz DZ** digraph triples are on **Live Keys AB R**, **BC R** and **AC R** respectively.

The **dž Dž DŽ** digraph triples are on **Live Keys AB D**, **BC D** and **AC D** respectively.

Letter **ě Ě** with Caron is on **AA F**

Letter **ľ Ľ** with Caron is on **BB '** (apostrophe)

Letter **ô Ô** with Circumflex is on **AA K**

Letter **ů Ů** with Ring Above is on **BB P**

Note: All the letters above (except the digraphs) can also be produced as conventional Dead Keys. Refer to the Dead Key Guide for more information. Most typists will likely prefer using Live Keys for these, since they are faster and require less effort. The digraphs are commonly typed as individual letters when there is limited font availability or keyboard support for these composite symbols.

See Quotes and related symbols for more information on available punctuation.

See Understanding modifier key notation for an explanation of modifier codes.

Dutch and Afrikaans

The Q Keyboard fully supports the Dutch and Afrikaans languages.

Where needed, Acute vowels **á Á é É í Í ó Ó ú Ú** are produced as Live Keys with **CC** plus the native letter.

Where needed, Grave vowels **à À è È ì Ì ò Ò ù Ù** are produced as Live Keys with **BB** plus the native letter.

Where needed, Diaeresis vowels **ä Ä ë Ë ï Ï ö Ö ü Ü** are produced as Live Keys with **AA** plus the native letter.

Where needed, Circumflex vowels **â Â ê Ê î Î ô Ô û Û** are produced as Live Keys with **CC** plus the letter **G F J K H** from the Southwest Vowels row, respectively.

While the Dutch language contains many potential accented letters, in practice Dutch writers may omit some accents when they are understood from the context, so you may observe that typical Dutch text does not have as much of a heavily-accented 'look' to it as you might expect. In a comparison of similar texts in Dutch and other Germanic languages, the Dutch words will often have fewer accented letters. This may also be seen in Afrikaans, a derivative of Dutch, which also uses few accents in practice.

Note: All the letters above can also be produced as conventional Dead Keys. Refer to the Dead Key Guide for more information. Most typists will likely prefer using Live Keys for these, since they are faster and require less effort.

Afrikaans

The Afrikaans language, which originated from Dutch, generally uses the same kinds of accents as Dutch, but in practice accented letters are not heavily used in everyday writing.

> Afrikaans can use accents on 13 letters, these being **á**, **é**, **è**, **ê**, **ë**, **í**, **î**, **ï**, **ó**, **ô**, **ú**, **û** and **ý**, which are all **Live Key** letters, making Afrikaans Live Key Conformant. However, a review of many samples of Afrikaans found these accents used only sparingly. See https://en.wikipedia.org/wiki/Afrikaans for more information.

In the past, Afrikaans used **Small Letter ’n Preceded by Apostrophe**. The Unicode standard describes this as a deprecated letter, which is defined on the Q Keyboard as ***Held AL , N*** and ***Held AL ' N*** rather than as a Live Key. However, preferred usage calls for a separate apostrophe and regular letter **n**, so when typed in the recommended way, Afrikaans is Live Key Conformant. The Q Keyboard supports Letter ’n Preceded by Apostrophe, even though it is deprecated in Unicode, for sake of completeness and because it remains present in the Windows WGL4 character list.

The currently recommended way to type this is to use **U+02BC Modifier Letter Apostrophe** followed by a regular **n** or **N**. This character can be found on **Live AC]** and on ***Held AL] '*** • The easier-to-type **U+2019 Right Single Quotation Mark** on **Live BL ,** (comma) is often identical in appearance to the apostrophe and may also be used.

Handling of Dutch IJ

The **IJ** digraph **ij IJ** is on **AB J** and **BC J** respectively.

The **IJ** digraph **íj ÍJ** with Acute **I** is on **AB ** and **BC ** respectively.

The Dutch language occasionally uses the **ij IJ** digraph with Acute on both the **I** and **J**. Unicode does not have precomposed symbols for these digraphs. When there is no convenient way to add an Acute to the letter **J** (as is usually the case), Dutch writers will typically accent just the **í Í** and leave the **J** as-is.

It is possible to add a combining Acute accent to a **j J** or to the digraph **íj ÍJ** by holding the **AA** key and pressing the **'** key **twice**. However, extensive testing has found that, with very few exceptions, most fonts fail to render this combination in an attractive way. Often, the added Acute is misaligned or does not match the shape or angle of the Acute on the **í Í**. For lower case, problems were found in adding an Acute both to an ordinary **j** and to the dotless **ȷ** letter.

Additionally, it was found that when a lower-case **í** with acute is next to an ordinary **j** the acute and dot parts seem to visually collide, harming readability. In Calibri, this displays as **íj** and looks muddy and blurred.

To resolve this, the Q Keyboard design uses a lower-case dotless **ȷ** instead. This has the added benefit that both the lower-case and upper-case digraphs **íȷ** and **ÍJ** have a similar, uncluttered and attractive appearance. In testing, this approach worked well regardless of the font used. The only special font requirement is the availability of a lower-case dotless **ȷ**. While this letter is not in the WGL4 or MES subsets, it is present in many fonts, including most of the popular Microsoft fonts you are likely to use. Be sure to test your fonts for availability.

If you have a favorite font that is missing this letter, it may be possible to use a font editor to create a new font that contains it, by copying the glyph for **U+006A Latin Small Letter J** to the position for **U+0237 Latin Small Letter Dotless J** and then removing the dot from the glyph with the editor.

> Keep in mind that font editor software may be costly and complex to learn. You will also have to review the licensing agreement for your font, to confirm you are authorized to make a modified version ("derivative work") for your own purposes. The most practical solution may be to ask your font vendor to add this letter, or use

another font where the letter is present.

The design of the digraphs **ij** and **IJ** here is admittedly an *ad hoc* proposal by the author, and while it *seems* reasonable, it may or may not be viewed as a "proper" or "orthodox" way to type Dutch. Comments from native speakers of Dutch having insights into this issue are welcomed. You can send your feedback about this or any other matter to info@qKeyboard.com. Should it turn out that these digraphs are unacceptable, they may be changed in a future version of the Q Keyboard, and until then you would have to type the **I** and **J** parts separately to suit your needs.

You may also find that for some fonts, you can successfully add an Acute to a *regular* letter **j** but **not** to a *dotless* **j**. If so, and you wanted Acute on both letters, you would have to type them individually, adding an Acute to **j** and not use the special **ij** digraph discussed here.

In case you were wondering, it **is** possible to add a **Double Acute** to a dotless **ı** and dotless **ȷ** to form a double-accented **ij** digraph. Depending on the fonts and applications you use, this may or may not work or be attractive or suitable for your needs. This 'trick' seems to work better on lower-case.

Unorthodox but interesting alternatives to handling accented IJ

Some Dutch writers have noted that the digraph **ij** looks a lot like a **y** with a diaeresis (depending on how the **i** is written, and especially when this is hand-written), and so sometimes **ÿ** is used as a substitute for **ij**. **Letter Y with Diaeresis** is available as **Dead Key AA : Y** and **Live Key AA Y**. However, most writers of Dutch consider the use of **ÿ Ÿ** with Diaeresis as a substitute for **ij IJ** to be deprecated.

Likewise, it might be possible to use **ý** or **ȳ** as a substitute for **ij̋ Y** with Double Acute requires a combining accent; because **y** normally does take accents, the Double Acute on **y** tends to be rendered well in many fonts.

Unicode has very few forms of accented **J**. One of those is **ɟ Ɉ with Dash Stroke**. Since there is also an **ɨ Ɨ with Dash Stroke**, we could use them for an alternate representation of the "accented" **IJ**. Here is an example, in Times New Roman:

ɨɟ ƗɈ

This is, of course, completely outside standard Dutch orthography, and likely would not gain wide acceptance in formal writing. However, it should be apparent at once to a native Dutch speaker what was intended. It's possible it could be used in creative works (such as advertising, graphic design, signs for movies and art museums, etc.) where such "artistic license" would be accepted and even welcomed. It also has the advantage of being very easy to write by hand, since the two Dash Stroke parts can be merged into a single

horizontal line. One point to be aware of is that in fonts with both letters, these often do not perfectly align the Dash part in **I** and **J**. Some do, such as Roman Cyrillic Std. If you wanted to try this, you should (as always) test your fonts to be sure your results are acceptable.

See Quotes and related symbols for more information on available punctuation.

See Understanding modifier key notation for an explanation of modifier codes.

Esperanto

The Q Keyboard fully supports the Esperanto language.

Circumflex letters **ĉ Ĉ ĝ Ĝ ĥ Ĥ ĵ Ĵ ŝ Ŝ** are produced as Dead Keys using **AA 6** plus the native letter.

See Key 06: Circumflex and Cyrillic for more information.

Letter **ŭ Ŭ** can be produced as Live Key **AA P** and as Dead Key **AA 0 U** (zero **U**)

The Esperanto currency symbol ₰ at **U+20B7** known as a **Spesmilo sign** is available on ***AL] X*** but is considered deprecated and obsolete. This currency was used briefly before World War I. For more information, see https://en.wikipedia.org/wiki/Spesmilo.

See Quotes and related symbols for more information on available punctuation.

See Understanding modifier key notation for an explanation of modifier codes.

French, Italian and regional languages

The Q Keyboard fully supports French, Italian and nearby regional languages of Catalan, Occitan and Breton.

- The Q Keyboard supports all keys on the newly proposed French AFNOR AZERTY and BÈPO layouts. See below.

- The Belgian Linux keyboard is often used to type French and other regional languages. The Q Keyboard fully supports the capabilities of this keyboard.

- At times, Spanish and Portuguese keyboards have been used to type French. Prior to the French AFNOR initiative, French keyboards did not fully support the French language and its writing requirements. The Q Keyboard **does**, making available all letters and punctuation called for by the French Language Academy (*Académie française*).

- An area of concern for the AFNOR initiative was the ability to type Polynesian languages, to address the needs of French Polynesia and elsewhere. The Q Keyboard fully supports this requirement.

Acute vowels **á Á é É í Í ó Ó ú Ú** are produced as Live Keys with **CC** plus the native letter.

Grave vowels **à À è È ì Ì ò Ò ù Ù** are produced as Live Keys with **BB** plus the native letter.

Diaeresis vowels **ä Ä ë Ë ï Ï ö Ö ü Ü** are produced as Live Keys with **AA** plus the native letter.

Circumflex vowels **â Â ê Ê î Î ô Ô û Û** are produced as Live Keys with **CC** plus the letter **G F J K H** from the Southwest Vowels row, respectively.

(It is understood that not all letters listed above are used in each language.)

Letter **ç Ç** with Cedilla is on **BB C**

For foreign loan words containing Tilde, **ñ Ñ** is on **CC N** and Tilde **A E I O U Y** uses **AB** and **BC** plus the native letter.

When needed, dotted **L** letter **l· L·** is on **BB ;** (semicolon) or via **AA . L**

Note: All the letters above can also be produced as conventional Dead Keys. Refer to the Dead Key Guide for more information. Most typists will likely prefer using Live Keys for these, since they are faster and require less effort.

When needed, Middle Dot · punctuation is on **CL –**

> French typists have recently shown an increased interest in the use of · **U+00B7 Middle Dot** (French, *point médian* **or** *point milieu*). The main area of interest appears to be in describing "optional pieces of words" that showed choices in the number or gender of some person or object. This style of composition is called "inclusive writing" (French, *écriture inclusive*) because the intent is to write in French so that it does not imply exclusion of persons on the basis of number or gender. In English, the closest similar spelling would be to use parentheses, like "word(s)" to mean "word or words". In French, it is as though they wanted to type "word·s".

Ligature **æ Æ** is on **CC Q**
When needed, **ǽ Ǽ** with Acute is on **CC W**

The ligature **ǣ Ǣ** with Macron is rarely used, but if needed this is on Dead Key **AA = Q**

Ligature **œ Œ** is on **CC P**

As a convenience, the single apostrophe **’** often used in French can be produced with **BL ,** (comma) in addition to the standard ways quotation marks are typed.

The guillemet quotes **«** and **»** are on (unshifted) **CL <** and **CL >**
Where needed, the single-angle quotes **‹** and **›** are on **AB [** and **AB]**

To use guillemet quotes with integrated non-breaking spaces, use **CU <** and **CU >**

To use guillemet quotes with integrated ***narrow*** non-breaking spaces, use **AC <** and **AC >**

> Note that ***narrow*** non-breaking spaces have limited font availability. Be sure to test your font to be sure that this character is present. If not, use **CU <** and **CU >** for guillemet quotes with regular non-breaking spaces. If you use narrow non-breaking spaces in your document but your font does not support them, you may encounter formatting and display problems.

Note that the Q Keyboard never modifies the way that Spacebar works, no matter what modifiers you might hold down. So, regardless of whether any of the AA, BB or CC modifiers are being used, Spacebar always produces an ordinary space. See Spacing and joining symbols for more information.

The Breton trigraph triples **c’h C’h C’H** are on **AB V** and **BC V** and **AC V** respectively.

French ordinal number abbreviations

The French "**e**"ordinal notation for numbers, which uses an **ᵉ** modifier letter like **4ᵉ** to

mean "fourth", can be typed using **Live Key AC E** or ***Held Key AL M E***.

While ᵉ is the most common ordinal, other letters are sometimes used, especially for the numbers 1-3. These additional superscript-like letters can be typed as ***Held keys***. The one exception is **è with Grave accent**, used in **1ᵉʳᵉ** to abbreviate "**première**". There is no such Unicode symbol as "**modifier letter small E with Grave accent**". If you needed this, you could either "cheat" and substitute a plain **e** for **è** and make it **1ᵉʳᵉ**, or else you would have to use a word processor that can format superscript letters. Some French typists will use ordinary letters when superscripts are not available, so **première** would become **1ère**. You could also omit the leading **è** and just use ʳᵉ as needed.

> Unlike English, which only uses "**st**" to abbreviate **1st** or **1ˢᵗ**, a French "first" could appear as **1ᵉ**, **1ʳᵉ**, **1ᵉʳ** or **1ᵉʳᵉ**. The different forms come from masculine vs. feminine ordinals and varying ways of abbreviating the end of the underlying word **première**.
>
> It is **possible** to add a Grave accent combining modifier to a modifier letter ᵉ, but in almost all fonts it is rendered poorly and is not recommended. A few fonts where this actually worked include Gentium Plus and Doulos SIL. If you must have a modifier ᵉ with a Grave accent, the word-processor approach will likely be the most successful.

Here are Held Key modifier letters you may need for French ordinals, besides **AC E**.

- These symbols do not use Shift.
- Note that for the ᵐ symbol, you must *hold* the **AA** modifier and type the **M** key **twice**, then release **AA**.
- Some French ordinals end in °. You could use ***AA M O*** as shown below, or possibly the masculine ordinal º on **AC O** might work for you. It may also be possible to substitute the ° **Degree** symbol on **BL –** for **Modifier Letter O**.

Sym	U+	*Held Key*
ᵈ	1D48	*AL M D*
ᵉ	1D49	*AL M E*
ᵐ	1D50	*AL M M*
ⁿ	207F	*AL M N*
ᵒ	1D52	*AL M O*
ʳ	02B3	*AL M R*

Support for the French AFNOR AZERTY and BÉPO layouts

In 2018 the French organization AFNOR published a draft proposal for revised AZERTY and BÉPO layouts to better support the French language. These two layouts have a comparable character repertoire, with just slight differences between AZERTY and BÉPO.

It is possible the characters supported on these layouts could change before receiving final approval. As of now, the Q Keyboard includes all current AFNOR characters in both the AZERTY and BÉPO keyboards as **Live Keys.** Note that the final AFNOR standard has been delayed several times, with the latest release date reported to be March 15, 2019.

> You may be able to find out about any changes to the release date at this **French** Wikipedia site: https://fr.wikipedia.org/wiki/AZERTY#Projet_de_norme_Afnor
> If you visit the AFNOR site directly, be aware that dates reported on by AFNOR use the customary European date format of **day/month/year**.
>
> If you use Google Chrome to browse this site, you can use Chrome's built-in translate feature to convert the text as needed. The information in question is at the bottom of a paragraph entitled (in English), **Draft Afnor Standard**.

Notes:

- The Q Keyboard has no "immediate accents", so its handling of Dead Keys always requires **AA** and one of the 24 Dead Key diacritic keys. There is no equivalent of a "Live Key" that implements a Dead Key accent. A standard French AZERTY keyboard has one immediate accent - the Circumflex; and one accent requiring just Shift - the Diaeresis.

- The **BÉPO** layout (not AZERTY) supports a "live" key for **U+1D49 ᵉ Modifier Letter Small E**, which is used for ordinal numbers such as **4ᵉ**. The ᵉ modifier is on **Live Key AC E**, as discussed above.

- Be aware that, in contrast to most (but not all) keyboards in the European Union, the Q Keyboard does not have a **€ Euro** symbol present on the **E** key. The **E** key is committed to other purposes, and the Q Keyboard does not have an **AltGr** key to provide the **AltGr E** key sequence commonly used for the Euro. The **€ Euro** symbol is easily typed as **Live Key CL 4**.

- In France and most EU countries, monetary amounts are shown as the number first, then a non-breaking space and finally the **€** Euro sign. This can easily be typed as **Live Key CU 4**, which contains an integrated non-breaking space followed by the **€** sign.

- AFNOR keyboards use the generic currency symbol ¤ as a *dead key*. On the Q Keyboard, ¤ is present on **Live Key AC Y** and **Dead Key AL 4 4** as an ordinary symbol, with ***AL [*** and ***AL]*** (plus a few others) serving the role of "currency dead keys". See Currency symbols for more information. Since nearly all international currency symbols are available on

the Q Keyboard, there will be less need to use ¤ as a substitution.

In the list below, you will see additional equality-type symbols also supported as Live Keys.

The AFNOR BÉPO keyboard currently has a reserved location for the "**CopyLeft**" symbol, which was approved by the Unicode Consortium in June 2018. The Unicode value for this symbol is **U+1F12F** according to https://en.wikipedia.org/wiki/Copyleft. For users interested in an approximation of this proposed symbol, Hyper key **ABC '** (apostrophe) has a **trigraph** containing **(ɔ)** with **U+0254 Small Letter Open O** in parentheses. You can also type Hyper key **BCU '** (apostrophe) to produce the Unicode value U+1F12F. This key will produce the correct Unicode code point, but there are few fonts that implement this symbol. Fonts are revised periodically, so you should check with your font vendor to see if support has been added. **Update**: As of February 2019, the most recent Roman Cyrillic Std font supports CopyLeft.

Here are highlights of French-specific and AFNOR-specific characters and how to type them. Where you see a "•" bullet in the description, it means the character can be typed more than one way, or it separates lower-case and upper-case for letters typed using the chords **AB** and **BC**.

Sym	U+	Type on Q Keyboard
§	00A7	CL 8
ə Ə	0259 018F	BB ` • Dead AA X X
†	2020	AC 1
‡	2021	AC 2
£	00A3	CL 3
-	2011	BU –
–	2013	AC –
—	2014	AC =
–	2212	CU –
∞	221E	CU 7 • Dead AL ` 8
±	00B1	CL =
¤	00A4	AC Y • Dead AL 4 4
µ	00B5	CL M
ª	00AA	AC A

º	00BA	AC O
ᵉ	1D49	AC E • *Held AL M E*
€	20AC	CL 4 • (NBSP+€) CU 4 • *AL [E*
®	00AE	AC X
√	221A	CU 6
þ Þ	00FE 00DE	AB P • BC P
¥	00A5	CL 7
ſ	017F	AC S
ß ß	00DF 1E9E	AB S • BC S
ŋ Ŋ	014B 014A	BB B
	2122	AC T
ij IJ	0133 0132	AB J • BC J
ʒ Ʒ	0292 01B7	BB 4
« »	00AB 00BB	CL , • CL . (key < and key >)
‹ ›	2039 203A	AB [• AB]
÷	00F7	CU /
⩽	2A7D	AC 4 • Dead AL < =
⩾	2A7E	AC 5 • Dead AL > =
≤	2264	BU , (key <)
≥	2265	BU . (key >)
₩	20A9	AC W • *Held AL [W*
¢	00A2	CL 2
©	00A9	AC C
ç Ç	00E7 00C7	BB C
×	00D7	CU 8
…	2026	BL .
·	00B7	CL –

°	00B0	BL –
¡	00A1	CL 1
¿	00BF	CL /
≃	2243	AC 6 • Dead AL 1 –
≅	2245	AC 7 • Dead AL 1 =
≡	2261	CU =
≢	2262	AC 9 • Dead AL / =
≈	2248	BL =
≉	2249	AC 8 • Dead AL / 2
≠	2260	BU =

See Quotes and related symbols for more information on available punctuation.

See Understanding modifier key notation for an explanation of modifier codes.

German and T2 keyboard

The Q Keyboard fully supports the German language.

German vowels **ä Ä ö Ö ü Ü** and also **ë Ë ï Ï ÿ Ÿ** are available on Live Keys using the **AA** modifier.

Note: The letters above can also be produced as conventional Dead Keys. Refer to the Dead Key Guide for more information. Most typists will likely prefer using Live Keys for these, since they are faster and require less effort.

The **Sharp S** letter **ß** and **ß** is on **AB S** and **BC S** • This letter is also known as **Eszett**, which is German for the names of letters **S** and **Z**. Eszett originally was the two letters **S** and **Z** (though they appeared more like **ſ** and **ʒ**) which over time merged into the ligature that became **ß ß**. Capital **ß** has only been an official part of the German alphabet since 2017, and is not used by all German-speaking regions. Wikipedia articles about this letter can be found here and here.

> The German word **Zett** is similar to **Zed**, the term used by most English-speaking countries, and is derived from the Greek letter **Zeta** that was adopted into the Latin alphabet in the 1st century BC. It seems that the U.S. is one of the few places where letter **Z** is pronounced "**zee**".

The **Long S** letter **ſ** is on **AC S**

When needed, other types of **Long S** letters are available as ***Held Keys***. Depending on the font used, the **Dash Stroke** and **Slash Stroke** forms may be hard to distinguish. Accented **Long S** letters are seldom used.

- Long S with Dot Above **ẛ** is on ***Held AL . S***
- Long S with Dash Stroke **ẜ** is on ***Held AL – S***
- Long S with Slash Stroke **ẝ** is on ***Held AL / S***

See the commentary here about typing the Germanic language **Hunsrik**.

Support for German T2 keyboard features

In addition to what is noted above, the Q Keyboard contains equivalent functionality for every feature present on the **German T2 keyboard**. The following is a description of each key on **T2** and how to obtain the same results on the Q Keyboard. A notation in ***red italic*** indicates a ***Held Key*** and **blue** indicates a **Live Key**.

Hyphenation symbol **SHY** is available as **Live Key AB –** and on **Dead AL – spacebar**
Joiner symbol **ZWNJ** is available as **Live Key AC **

These are present to assist users familiar with the **T2** keyboard.

See Dashes and hyphens for issues to consider regarding the use of **SHY**.

Incidentally, the Q Keyboard can also produce every symbol on the **German T3** keyboard design specification, which is even more comprehensive than T2. T3 has a greatly extended character set, called the "Common Secondary Group" of the ISO standard ISO/IEC 9995-3:2010. Because the T3 character set is so large, it is targeted more to language experts than to the average user, and is not generally available. See the ISO article in Wikipedia for more information; select "Common Secondary Group" from section 4.1 in the table of contents.

Owing to its extensive features, the Q Keyboard is more powerful than the German T3 design.

Key	T2 Feature	Equivalent on Q Keyboard
Left of 1	Circumflex dead key	**AA 6**
	Degree mark °	**BL –**
	"**x**" dead key, used for miscellaneous letters and symbols	**AA M** for Miscellaneous keys **AA X** for Extra keys **CU 8** or ***Held AL X X*** for Multiplication Sign **×** ***AL M X*** for Modifier Letter ˣ ***AU 0 X*** for Combining Modifier Letter **x** such as ŏ
1	9 quote ’	**CL]** • see Quotes and related symbols
2	Superscript ²	**CU 2** • see Superscripts and Subscripts
3	Superscript ³	**CU 3** • see Superscripts and Subscripts
	Section mark **§**	**CL 8**
4	Em Space	***AL / M*** • see Spacing and joining symbols
5	Inverted Exclamation **¡**	**CL 1**
6	Inverted Question **¿**	**CL /**
Right of 0	Small letter **ß**	**AB S**
2nd right of 0	Acute dead key	**AA '**
	Grave dead key	**AA `**
	Dot Above dead key	**AA .**

W	Caron dead key	**AA]**
E	Euro sign **€**	**CL 4** • (NBSP+€) **CU 4** • ***AL [E***
	Ligature **œ Œ**	**AA P**
R	Diaeresis dead key	**AA :**
T	Macron dead key	**AA =** • Macron letters also on Northwest Vowel keys
Z	Double Acute dead key	**AA 3** Hungarian **ű Ű** and **ő Ő** also available on **Live Keys AA H** and **AA K**. Double Acute combining modifier is on ***Held AL 3 3***
U	Breve dead key	**AA 0**
I	Tilde dead key	**AA 1** • Tilde **ñ Ñ** also available as **CC N** • Other tildes for vowels **A E I O U Y** use **AB** and **BC** modifiers
	Dotless **ı**	**AA J** has **ı** and **İ** • See also Dead Key **AA . I**
O	Ring Above dead key	**AA 8** **Ring letters åÅ ǎǍ and ůŮ available as Live Keys**
	O with slash stroke **ø Ø**	**CC 0** (zero) • **AA / O**
P	Hook Above dead key	**AA 7**
	Letter Thorn **þ Þ**	**AB P** and **BC P**
Ü	Letter **ü Ü**	**AA U** • **AA : U**
	Long S **ſ**	**AC S**
	Horn dead key	Cedilla dead key can be used for **ư Ư** and **ơ Ơ**. Letters **ư Ư** and **ơ Ơ** are Live Keys **AA V** and **AA B** See Part 6: Support for Vietnamese for more information.
A	Ligature **æ Æ**	**CC Q**
	Math symbol **≤**	**BU <**
S	Math symbol **≥**	**BU >**
D	Letter Eth **ð Ð**	**BB D**
	Diameter symbol ⌀	**AC 0** (zero)

F	Prime '	**AC G** • **ABC [**
G	Double Prime ”	**AC H** • **ABC]**
H	Capital letter **ß**	**BC S**
J	Cedilla dead key	**AA ,**
K	Comma Below dead key	Most comma-below letters produced with Cedilla dead key. Comma Below **ș Ș** and **ț Ț** can be typed on ***Held AA , S*** and ***Held AA , T*** **Comma Below S** and **T** also produced with **BB S** and **BB T** • **Cedilla S** is **BB X** • **Cedilla ţ** is **AB T** and **Ţ** is **BC T** • See also **AA , T**
L	Ogonek dead key	**AA 5** • Ogonek letters also on Southwest Vowel Live Keys using **BB**
	Letter L with stroke **ł Ł**	**AA L** • **AA / L**
Ö	Letter **ö Ö**	**AA O** • **AA : O**
	Dot Below dead key	**AA **
Ä	Letter **ä Ä**	**AA A** • **AA : A**
	Dash Stroke dead key	**AA –**
Right of Ä	Registered Trademark ®	**AC X**
	Letter schwa **ə Ə**	**BB `** • **AA X X**
Y	Single right angle quote ›	**AB]**
X	Double right angle quote »	**CL >**
	Low 99 quote „	**CU ;** • see Quotes and related symbols
C	Copyright ©	**AC C**
V	Double left angle quote «	**CL <**
	66 quote “	**CU [** • see Quotes and related symbols
B	Single left angle quote ‹	**AB [**
	99 quote ”	**CU]** • see Quotes and related symbols
N	En Space	***AA / N*** • **see** Spacing and joining symbols

M	Micro symbol **µ**	**CL M** • **Greek Mu µ** on **AL 4 M**.
, ; Key	Ellipsis symbol **…**	**BL .** (period)
	6 quote ‘	**CL [** • see Quotes and related symbols
. : Key	Middle Dot ·	**CL –**
	ZWNJ joining code	**AC ** • ***AL /.*** • see Spacing and joining symbols
- _ Key	Soft Hyphen (SHY)	**AB –** • **AA – Spacebar** • see Dashes and hyphens
Spacebar	NBSP	**CL `** • **AA X Spacebar**
	NNBSP	**CU `** • **AA M Spacebar**
		See also Spacing and joining symbols

See Quotes and related symbols for more information on available punctuation.

See Understanding modifier key notation for an explanation of modifier codes.

Hungarian

The Q Keyboard fully supports the Hungarian language.

Acute vowels **á Á é É í Í ó Ó ú Ú** are produced as Live Keys with **CC** plus the native letter.

Where needed, Grave vowels **à À è È ì Ì ò Ò ù Ù** are produced as Live Keys with **BB** plus the native letter.

Diaeresis vowels **ë Ë ö Ö ü Ü** are produced as Live Keys with **AA** plus the native letter. (Letter **ë Ë** is used mostly in academic discussions of Hungarian.)

Note: All the letters above can also be produced as conventional Dead Keys. Refer to the Dead Key Guide for more information. Most typists will likely prefer using Live Keys for these, since they are faster and require less effort.

The letters **ő Ő** and **ű Ű** in Hungarian are the only letters in Unicode having the Double Acute accent. The Q Keyboard uses **AL 3** for both the **Double Acute** and the **Double Grave** dead key. You will likely prefer to use the **Live Keys** listed below for these letters.

There will generally be little need to add a Double Acute accent to other letters, but if you wish to, this is available on ***Held AL 3 3***. Be sure to ***hold*** **AL** when adding this accent. If you were to type this as **Dead AL 3 3** instead, it is the combining accent for **Double Grave**.

> Because there are also Double Grave letters **ȍ Ȍ** and **ȕ Ȕ** these must be typed with ***Held Key AA 3 O*** and ***Held Key AA 3 U*** respectively when needed. It is understood that these letter assignments are inconsistent, but it was felt that giving priority to Hungarian typists was more important than the Double Grave letters, which are rarely used except in academic works and dictionaries.
>
> There are a few African languages that add Double Acute and Double Grave to a variety of letters, but even this usage is relatively rare.
>
> In case you were wondering, it is possible to add a Double Acute to a dotless **ı** and dotless **ȷ** to form a double-accented Dutch ǐǰ digraph. Depending on the font and applications you use, this may or may not be suitable for your needs.

Letter **ő Ő** with Double Acute is on **Live Key AA K** and on Dead Key **AA 3 O**

Letter **ű Ű** with Double Acute is on **Live Key AA H** and on Dead Key **AA 3 U**

The **dz Dz DZ** digraph triples are on **Live Keys AB R**, **BC R** and **AC R** respectively.

Letter combinations **dž Dž DŽ** can be typed as individual letters using **ž Ž** instead of the

single-valued Unicode digraphs noted above. Likewise, digraphs **dz Dz DZ** can be typed as separate letters. This is often done when available fonts or keyboards do not support the digraphs.

See Quotes and related symbols for more information on available punctuation.

See Understanding modifier key notation for an explanation of modifier codes.

Lisu Fraser transcription

Lisu is a language spoken in China, Myanmar, Thailand and India. A discussion of this language can be found on Wikipedia. One means of representing the Lisu language is with the Fraser alphabet, an invented script which contains all-capital letters, some of which are turned.

The Q Keyboard does not support the Lisu language, since its letters are not Latin but Latin-***like***.

However, if you wanted to **transcribe** Lisu, it is possible to use the features of the Q Keyboard to create an alternate representation of it. This should be enough that you could apply an automated text filtering process to convert the transcription into correct Lisu letters, if desired. You would have to devise your own text filtering software, since the Q Keyboard installation does not provide this.

The transcription methodology would work as follows:

1. For any Lisu letters that look like a normal upper case Latin letter, use the corresponding Latin letter.

2. For any Lisu letters that look like a turned Latin letter:
- if a **Dot Above** precomposed letter is available, use that
- if no Dot Above precomposed letter is available, but a **Dot Below** form is available, use that

3. For the Lisu letter that looks like a turned L, there is a Dot Below form but no Dot Above form. However, Since there is **Ḷ with Middle Dot**, this is recommended.

4. For the Lisu letter that looks like a turned **J**, Unicode has no dot forms available. The recommended transcription is **ɟ with Dash Stroke**.

5. For the Lisu punctuation symbols, use ordinary QWERTY punctuation. The **U+A4FE** punctuation **꓾** that looks like a hyphen with a dot below could be typed as **–.** hyphen *followed* by a dot, or perhaps as the **Logical Not** symbol **¬** which somewhat resembles it. Logical Not is on **CL 6**.

6. A language called Naxi sometimes uses the Fraser alphabet. Naxi also has an inverted **Y** that is not defined in Unicode. If you wanted to transcribe this letter, you could use **Ẏ with Dot Above**.

7. Because all these letters are typed using either standard QWERTY keys or Q Keyboard **Dead Keys**, it means that **they all respect Caps Lock**, which is helpful since all of the letters are upper-case forms. As usual, the **punctuation** is not affected by Caps Lock.

8. To accommodate Lisu transcription, the **Dot Below** letters **Ḳ Ụ** and **Ṿ** are defined as Convenience keys that can be typed *as if* **Dot Above**. Likewise, **Capital Ɨ with Dash Stroke** can also be typed *as if* **Dot Above**. This means that for Lisu transcription, you need only use the **AA .** Dead Key.

Here is the Unicode block from U+A4D0 to U+A4FF containing Lisu letters.

U+	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
A4D_	B	P	ɟ	D	T	⊥	G	K	ꓘ	J	C	Ɔ	Z	F	Ƒ	M
A4E_	N	L	S	R	Ʀ		V	H	Ɣ	ſ	W	X	Y	Ƀ	A	Ɐ
A4F_	E	Ǝ	I	O	U	∩	⅃	ᗡ	.	,	..	.,	;	:	-.	=

Here is the transcription as described above, with altered letters in **red**, and letters **not taking Dot Above** highlighted in **black** with a yellow background, and **L· with Middle Dot** in **light blue**. The Unicode row and column labels seen below are for comparisons to the **real** Lisu letters above. None of the **substitutions** below are in the Lisu Unicode range. You might also need **Ẏ** for Naxi, a letter not in the Lisu block above.

U+	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
A4D_	B	P	Ṗ	D	T	Ṫ	G	K	Ḳ	J	C	Ċ	Z	F	Ḟ	M
A4E_	N	L	S	R	Ṙ	Ṿ	V	H	Ġ	ɨ	W	X	Y	Ḃ	A	Ȧ
A4F_	E	Ė	I	O	U	Ụ	L·	Ḍ	.	,	..	.,	;	:	-.	=

Notes:

- It's not possible to use other Unicode letters to avoid this dotted-letter technique. It's true that there are things like **Ǝ LATIN CAPITAL LETTER REVERSED E**, but not all of the turned letters in Lisu also exist as Latin letters, so it wouldn't work.

- The methodology described here to **transcribe** Lisu should be considered only an *ad hoc* technique. If you are a native speaker of Lisu, this would not be appropriate because it's overly hard to use. It would be easier to just make a native Lisu keyboard instead. Many people have done just that. An Internet search for **Lisu Keyboard** should provide whatever resources you might need.

- A very simple transcription method could use capital Latin for regular Lisu letters, and lower case for the Lisu turned letters. For most of the letters this would work well. Upper case **K** and lower case **k** are similar and could cause problems. Upper case **I** and lower case **L** (that is, **l**) are not always distinct. There are turned Latin letters **ꓘ** and **ꓘ** that could resolve that. This is not a recommendation, but just an idea to consider.

These turned letters are on Dead Key 0A (**0**). Other variations of **K** and **L**, such as **Ḱ Ꝁ Ḵ** and **Ł Ɫ L· Ľ** are also possible.

The Lisu alphabet itself is not supported because it is outside what the Q Keyboard is intended for. Your feedback on this Lisu transcription feature, or any other issues with the Q Keyboard, are welcomed.

Pinyin script

The Q Keyboard fully supports the Pinyin script.

> Here, **Pinyin** Script refers to the Romanization system for standard Chinese. It should not be confused with the unrelated Pinyin *language* of the same name, spoken in the African nation of Cameroon. The Q Keyboard also supports the Pinyin language, which requires the letters **ə ɨ ŋ ʉ** and **ẅ** and uses several tone marks.

Pinyin script uses the Tone Marks **Macron**, **Acute**, **Caron** and **Grave** on its vowels. Diaeresis **ü Ü** is considered a separate letter, which can itself take a Tone Mark. When **ü Ü** requires a Tone Mark, you can apply a combining diacritic symbol to **ü Ü** or you can used the precomposed letters shown below as ***Held Keys***.

For standard accented vowels, these may be typed using Live Keys or Dead Keys.

Some Pinyin writing uses **Latin Alpha ɑ** and **Latin Script G**. These may be considered optional, regional variants of standard Latin letters **A** and **G** in some cases, while other usage may require them as distinct letters.

Latin Letter	Dead Key	AL u+	AL sym	AU U+	AU Sym
Alpha †	AA X A	0251	ɑ	2C6D	ᗡ
Script G ‡	AA M G	0261	ɡ	A7AC	ꞡ

† For some reason, Capital Latin Alpha seems to be rendered overly large in several fonts.
‡ Capital Script G is available in few fonts.

Tones on **ɑ ᗡ** require combining diacritics; there are no precomposed Alpha letters with accents. In theory, it is possible to use **Greek Alpha with Tonos ά** for an acute Alpha, but that would be nonstandard.

<u>Dual-accented tones on U</u>

Tones on **ü Ü** are produced using ***Held Key*** sequences. The Q Keyboard offers **two methods** for producing these dual-accented letters:

- **Method 1** uses a "shorthand" technique in which **only the accents** of the letter **U** are typed.
- **Method 2** uses more conventional Held Key sequences.

It is expected that the accent-only **Method 1** will be used by those who type Pinyin letters frequently, because they are designed to maximize **ease of use**.

For the letter **ǜ Ǜ** there is a second, convenience Method 1 key sequence that is easier to type, using the **[** left bracket instead of the ` grave accent key.

The more conventional **Method 2** will be **easier to remember** if you don't use these letters very often.

For completeness, the similar-looking non-Pinyin letter **ǖ Ǖ** is also included in the table. This letter is **not** part of Pinyin, but you may have other uses for it. Letter **ǖ Ǖ** is the only one in Unicode with dual accents that are the reverse order of another letter, namely **ǘ Ǘ**. They can be easily confused unless you look closely.

Held Key ¹	*Held Key ²*	AL u+	AL sym	AL U+	AU Sym
		Pinyin Letters			
AA : =	*AA = U*	01D6	ǖ	01D5	Ǖ
AA : '	*AA ' U*	01D8	ǘ	01D7	Ǘ
AA :]	*AA] U*	01DA	ǚ	01D9	Ǚ
AA : `	*AA ` U*	01DC	ǜ	01DB	Ǜ
AA : [	---	01DC	ǜ	01DB	Ǜ
		Non Pinyin Letter			
AA = :	*AA [U*	1E7B	ǖ	1E7A	Ǖ

Example: Type **ǘ** with Diaeresis and Acute accent.

1. Press and **continue to hold** the **AA** modifier key
2. Type the **:** key
3. Type the **'** key
4. The letter **ǘ** with Diaeresis and Acute accent appears
5. Release the **AA** key

See Quotes and related symbols for more information on available punctuation.

See Understanding modifier key notation for an explanation of modifier codes.

Polish

The Q Keyboard fully supports the Polish language.

> **Note:** Polish typewriters had a QWERTZ layout, while most current Polish computer keyboards use QWERTY and closely follows the U.S. QWERTY. For that reason, the QWERTY variant of the Q Keyboard can serve well as a replacement for the layout known as the "Polish Programmer's Keyboard". All extra letters and symbols present on the Polish Programmer's Keyboard are available as **Live Keys**, as discussed below.

Acute letters **á Á é É í Í ó Ó ú Ú** and **ć Ć ś Ś ź Ź** are produced as Live Keys with **CC** plus the native letter.

Ogonek vowels **ą Ą ę Ę ¡ Ą ǫ Ǫ ą Ą** are produced as Live Keys with **BB** plus the letter **G F J K H** from the Southwest Vowels row, respectively.

(It is understood that Polish does not use all the letters listed above.)

Letter **ń Ń** with Acute is on **CC B**

Letter **ł Ł** with Slash Stroke is on **AA L**

Letter **ż Ż** with Dot Above is on **BB Z**

Note: All the letters above can also be produced as conventional Dead Keys. Refer to the Dead Key Guide for more information. Most typists will likely prefer using Live Keys for these, since they are faster and require less effort.

See Quotes and related symbols for more information on available punctuation.

See Understanding modifier key notation for an explanation of modifier codes.

Polynesian languages

"Polynesian" is not a language *per se*. The term is used to describe a class of languages that have two common traits.

First, they generally use a **Macron** (line above) to indicate a long vowel.

> When speakers of Polynesian languages need to indicate a long vowel but their keyboard does not support Macron accents, they may use other marks that are available, such as Tilde, Diaeresis or Circumflex. In most cases, Macron is the preferred accent.

Second, they use a **Modifier Letter Turned Comma** symbol ʻ as a glottal stop. This symbol is known by different names, depending on the language. A Wikipedia article on this subject found here shows the following usage:

Language	Terminology
Hawaiʻian	**ʻokina**
Samoan	**koma liliu**
Tahitian	**ʻeta**
Tongan	**fakauʻa** or **fakamonga**
Māori	**ʻamata** or **ʻakairo ʻamata**
Wallisian	**fakamonga**

You can use the Q Keyboard to type Polynesian languages using the following features.

Macron letters can be typed two different ways:
- via the **Northwest Vowel** Live keys
- via the **Macron** =+ Dead Key

The glottal symbol ʻ is **U+02BB Modifier Letter Turned Comma**.

To make this convenient to type, this can be found here:

- **Live Key AC [**
- ***Held Key AL , .***
- ***Held Key AL . ,***
- ***Held Key AL ['***

> **Note 1**: It is not recommended to use **Live Key BL ,** (comma). That would produce the

similar-looking **Modifier Apostrophe** symbol ʼ often used in French. Sometimes Polynesian typists will use this also, but the current preferred practice in most of these languages is to use the **Modifier Letter Turned Comma** when it's available, rather than the Modifier Apostrophe.

Note 2: Be aware that the visual distinction between **Modifier Letter Turned Comma** and **Modifier Letter Apostrophe** greatly depends on the font used. For Times New Roman they appear as ʻ and ʼ while in Calibri they look like ʻ and ʼ instead and are hard to tell apart. If it is important for you to select the right one, be sure to use a distinctive font to help you choose correctly.

Note 3: There is a somewhat similar punctuation ꞉ called **U+2E32 Turned Comma** that does **not** contain the phrase "**Modifier Letter**" in its name. This is available in few fonts, and it is the wrong one to use with Polynesian languages (it sits too low). The Turned Comma is on **Dead Key AL . ,**

Note 4: **Modifier Letter Turned Comma** may look identical to the **Single Left Quotation Mark** on **CL [** but that is a different character.

Alternative form of glottal stop

A recent update to the Wikipedia **ʻOkina** article states that in Tahitian and Wallisian, the correct appearance of the **ʻeta** symbol in their languages should be more like **ˆeta.** There is no current or proposed Unicode character assigned for this purpose. Should you wish to use a similar character as a substitution, you could try the "Inverted Breve Literal Symbol" on **Dead Key AA 9 Spacebar**, as it appears here in the example above as **ˆeta**. As with all literals using Spacebar, it does not matter whether or not you hold **AA** at the time the Spacebar is pressed.

See Quotes and related symbols for more information on available punctuation.

See Understanding modifier key notation for an explanation of modifier codes.

Romanian

The Q Keyboard fully supports the Romanian language.

Letter **ă Ă** with Breve is on **AA Q**

Letter **â Â** with Circumflex is on **CC G**

Letter **î Î** with Circumflex is on **CC J**

Letter **ș Ș** with Comma Below is on **BB S** • Letter **ş Ş** with Cedilla is on **BB X**

Letter **ț Ț** with Comma Below is on **BB T** • Letter **ţ Ţ** with Cedilla is on **AB T** and **BC T** respectively.

When needed, Acute vowels **á Á é É í Í ó Ó ú Ú** are produced as Live Keys with **CC** plus the native letter.

Note: All the letters above can also be produced as conventional Dead Keys. Refer to the Dead Key Guide for more information. Most typists will likely prefer using Live Keys for these, since they are faster and require less effort.

Speakers of the **Romani** language, which is not the same as Romanian, will at times use the Romanian alphabet. Some dialects of Romani also use certain Greek letters. These are available on Dead Key 04.

See Quotes and related symbols for more information on available punctuation.

See Understanding modifier key notation for an explanation of modifier codes.

Russian keyboard

In order to help you visualize how Cyrillic support is handled for a specific language, the following table shows the Q Keyboard key sequences for the **Windows Russian keyboard layout**, which is the one most commonly used in Russia.

> There are other Russian layouts, such as one used on typewriters, and a phonetic one that attempts to equate Russian letters with QWERTY letters having a similar appearance or pronunciation. Additionally, there are many non-Russian Cyrillic layouts, such as Serbian and Bulgarian, which are incompatible with Russian. That is why Cyrillic support on the Q Keyboard is not modeled after Russian or any other national keyboard.

A diagram of the Windows Russian keyboard layout can be found here. Further information can be found on Wikipedia at https://en.wikipedia.org/wiki/Keyboard_layout under paragraph **6.4.2**.

The following points should be noted:

- Remember that the **AA** modifier must be used for all keys, even though it is not repeated within the table. For lower-case letters, a reference to **dead w d** means **dead AL w d**, which in turn means **dead AA w d**. For upper-case letters, a reference to **DEAD W D** means **DEAD AU W D**, which in turn means **DEAD AA+Shift W D**.

- For some letters, there is more than one way to type them. What appears below are recommended key sequences that should be easy to remember, but are not the only ones in all cases. Consult Key W and the Cyrillic Guide for complete details on what letters are available and where they are located.

- The Windows Russian layout is based on QWERTY, and normally will have English QWERTY symbols combined with Cyrillic. So the **Q** key will have legends for both **Q** and **Й**. Note that the QWERTY positions are shown only to explain their physical location, not the meaning of any Cyrillic letter at that location. Thus, the Cyrillic letter **л Л** letter that corresponds to Latin **L** is on the **K** key *in the table*, not the **L** key, because that is where **л Л** is located on the **Russian** keyboard. Even so, you must still use the QWERTY **L** key to type this letter on the Q Keyboard.

- The Russian keyboard uses a tall Enter rather than a wide QWERTY enter (as shown here). That causes a few keys to be relocated.

- Letters shown below with the upper-case form in **blue**, such as **DEAD W 0** on the **A** key, are a reminder that **Caps Lock will not work for non-letter keys**. You can still use Early Shift or Late Shift as you prefer. ***Held Key*** letters shown in **red** require **Full Shift** for upper case. See Capitalization rules for more information. A similar issue affects capital letter **Ъ** on ***HELD* 7 6; s**ee QWERTY **]** key below.

- Note the two **Live Key** symbols in **all blue**, which are **AC 3** and **AC P**, for the **№** and **₽** symbols.

- Characters common to both QWERTY and the Windows Russian keyboard are not explained here, such as the digit **2**. Some punctuation symbols are in different locations. The Windows Russian keyboard does not have all of the special characters that are on QWERTY such as **@ # $ ^ | ¦ < >** and is also missing the angle quotation marks **« »** often used in Russian, as well as other symbols. Simply type the standard QWERTY keys or characters provided by the Q Keyboard for the symbols you need.

- The letter **л 043B** on **Dead AL W L** uses lower-case **L** without Shift. It is hard to find a font for a lower-case **L** to use in the table that does not look like the letter **I** or the digit **1**. This key is highlighted using a **ℓ script lower case L in yellow** as a reminder that this is the **L** key being referenced.

- On the Russian keyboard, the shifted **8** key has ***** the same as QWERTY. This was **omitted** from the table below, to make room for the Ruble sign **₽** that is typed on the **Russian** keyboard using **AltGr 8** and on the Q Keyboard as **AC P**. This is only a substitution in the ***table***, not on the ***keyboard***. The **Ruble sign ₽** is shown as black on yellow background as a reminder of this. Ruble sign **₽** is also available as ***Held AL [P***.

QWERTY Keys		Cyrillic Keys				dead	AL+	DEAD	AU+
LC key	UC key	u+	sym	U+	SYM	*held*	*AL+*	*HELD*	*AU+*
`	~	0451	ё	0401	Ё	*held*	w e	*HELD*	W E
1	!	0031	1	0021	!				
2	@	0032	2	0022	"				
3	#	0033	3	2116	№			Live	AC 3
4	$	0034	4	003B	;				
5	%	0035	5	0025	%				
6	^	0036	6	003A	:				
7	&	0037	7	003F	?				
8	*	0038	8	20BD	₽			Live	AC P
9	(	0039	9	0028	(				
0	)	0030	0	0029	)				
-	_	002D	-	005F	_				
=	+	003D	=	002B	+				
Right of =+ key		005C	\	002F	/				

q	Q	0439	й	0419	Й	dead	w z	DEAD	W Z
w	W	0446	ц	0426	Ц	dead	w u	DEAD	W U
e	E	0443	у	0423	У	dead	w y	DEAD	W Y
r	R	043A	к	041A	К	dead	w k	DEAD	W K
t	T	0435	е	0415	Е	dead	w e	DEAD	W E
y	Y	043D	н	041D	Н	dead	w h	DEAD	W H
u	U	0433	г	0413	Г	dead	w 7	DEAD	W 7
i	I	0448	ш	0428	Ш	dead	w w	DEAD	W W
o	O	0449	щ	0429	Щ	*held*	w w	*HELD*	W W
p	P	0437	з	0417	З	dead	w 3	DEAD	W 3
[	{	0445	х	0425	Х	dead	w x	DEAD	W X
]	}	044A	ъ	042A	Ъ	*held*	7 6	*HELD*	7 6
\	|	relocated							
a	A	0444	ф	0424	Ф	dead	w 0	DEAD	W 0
s	S	044B	ы	042B	Ы	dead	6 1	DEAD	6 1
d	D	0432	в	0412	В	dead	w b	DEAD	W B
f	F	0430	а	0410	А	dead	w a	DEAD	W A
g	G	043F	п	041F	П	dead	w v	DEAD	W V
h	H	0440	р	0420	Р	dead	w p	DEAD	W P
j	J	043E	о	041E	О	dead	w o	DEAD	W O
k	K	043B	л	041B	Л	dead	w ℓ	DEAD	W L
l	L	0434	д	0414	Д	dead	w d	DEAD	W D
;	:	0436	ж	0416	Ж	dead	w [	DEAD	W [
'	"	044D	э	042D	Э	dead	w 2	DEAD	W 2
z	Z	044F	я	042F	Я	dead	w r	DEAD	W R
x	X	0447	ч	0427	Ч	dead	w 4	DEAD	W 4
c	C	0441	с	0421	С	dead	w c	DEAD	W C
v	V	043C	м	041C	М	dead	w m	DEAD	W M
b	B	0438	и	0418	И	dead	w n	DEAD	W N
n	N	0442	т	0422	Т	dead	w t	DEAD	W T
m	M	044C	ь	042C	Ь	dead	7 6	DEAD	7 6

,	<	0431	б	0411	Б	dead	w 6	DEAD	W 6
.	>	044E	ю	042E	Ю	dead	1 0	DEAD	1 0
/	?	002E	.	002C	,				

See Quotes and related symbols for more information on available punctuation.

See Understanding modifier key notation for an explanation of modifier codes.

Scandinavian languages

The Q Keyboard fully supports the Scandinavian languages Danish, Finish, Greenlandic, Icelandic, Norwegian, Swedish and others similar to them. Support for Sámi languages is discussed below.

Acute vowels **á Á é É í Í ó Ó ú Ú ý Ý** and **ć Ć ś Ś** are produced as Live Keys with **CC** plus the native letter.

Grave vowels **à À è È ì Ì ò Ò ù Ù** are produced as Live Keys with **BB** plus the native letter.

Diaeresis vowels **ä Ä ë Ë ï Ï ö Ö ü Ü** are produced as Live Keys with **AA** plus the native letter.

Circumflex vowels **â Â ê Ê î Î ô Ô û Û** are produced as Live Keys with **CC** plus the letter **G F J K H** from the Southwest Vowels row, respectively.

Caron letters **č Č ř Ř š Š ž Ž** are produced as Live Keys with **AA** plus the native letter.

Letter **ǧ Ǧ** is on **BB]**

Letter **å Å** with RIng Above is on **BB Q**

Letter **ç Ç** with Cedilla is on **BB C**

Letter **Eth ð Ð** is on **BB D** • Letter **đ Đ** with Dash Stroke is on **CC D**

Letter **ŧ Ŧ** with Dash Stroke is on **CC T**

Letter **ł Ł** with Slash Stroke is on **AA L**

Letter **ñ Ñ** with Tilde is on **CC N**

Tilde letters **ã Ã ẽ Ẽ ĩ Ĩ õ Õ ũ Ũ** are produced as Live keys with **AB** plus the native letter for lower case, and **BC** plus the native letter for upper case.

Letter **ń Ń** with Acute is on **CC B**

Letter **Eng ŋ Ŋ** is on **BB B**

Letter **ø Ø** with Slash Stroke is on **CC 0** (zero).

Letter **ǿ Ǿ** with Slash Stroke and Acute is on **BB 0** (zero).

Letter **Thorn** **þ Þ** is on **AB P** and **BC P** respectively.

Letters **Ezh ʒ Ʒ** and **Ezh with Caron ǯ Ǯ** used in some Latin-based **Sámi** languages are on **BB 4** and **BB 5** respectively.

Note: Most of the letters above can also be produced as conventional **Dead Keys**. **Thorn** and **Ezh** letters are only available as **Live Keys**. Refer to the Dead Key Guide for more information. Most typists will likely prefer using Live Keys for these, since they are faster and require less effort.

Letter **ǻ Ǻ** with RIng Above and Acute is on **BB W** and on ***Held Key AA ' A***

Ligature **æ Æ** is on **CC Q**

Ligature **ǽ Ǽ** with Acute is on **CC W**

When needed, ligature **ǣ Ǣ** with Macron is on **Dead Key AA = Q**

Scandinavian languages do not typically use **ǣ Ǣ** with Macron, but there may be some technical or linguistic applications that require it.

Ligature **œ Œ** is on **CC P**

Lower case letter **ĸ Kra** is on **AC K** • In many fonts, lower-case **ĸ** letter **Kra** appears identical to Latin Small Capital **ĸ** and to lower-case Greek **κ Kappa**. Upper case letter **K‘ Kra** must be composed manually using plain **K** followed by a **Modifier Letter Turned Comma ‘**

Letter **Kra** is deprecated in the Greenlandic language, which now uses the letter **q Q** for the purpose formerly served by **Kra**. You would normally only use **Kra** in Greenlandic when typing examples of the deprecated orthography.

Letter **ǥ Ǥ** with Dash Stroke is on **AA – G**

Modifier Letter Turned Comma is found in several locations on the keyboard, as noted in Polynesian languages.

Support for Sámi languages

The term **Sámi** describes a group of related Scandinavian languages spoken in parts Norway, Sweden, Finland and Russia. Some of these use Latin alphabets and some use Cyrillic. The area within these countries where Sámi is spoken is known as **Northern Fennoscandia**.

> The **Sámi** peoples and languages have been known in the past as **Lapp** and the region known as **Lapland** or **Lappland**, but these terms are controversial and have mostly

fallen out of favor, and are not generally used. The Sámi people themselves refer to their own region as **Sápmi**.

Sámi languages do not have a large user population, and some dialects of Sámi are considered endangered.

For an overview of Sámi languages, this article on Omniglot is helpful.

The Wikipedia article on Sámi discusses all of the Sámi dialects and has links to more detailed articles on each dialect.

For Cyrillic-based Sámi, see the Cyrillic guide for more information.

For Latin-based Sámi, all the information above applies. In addition, there are a number of Convenience keys that may be helpful in typing Sámi, such as key sequences for **Caron** letters and accented forms of the letter **G** that may be easier to type.

Sámi languages may use one or more of the following types of punctuation:

U+	Sym	Key	Description
0027	'		Apostrophe
00B4	´	LIVE AC `	Acute Accent
02B9	'	DEAD AL M '	Modifier Letter Prime
02BC	'	DEAD AL . ,	Modifier Letter Apostrophe
02C8	'	DEAD AL - ;	Modifier Letter Vertical Line
02CA	´	*HELD AU ' '*	Modifier Letter Acute Accent
0323	ọ	*HELD AL \ *	Combining Dot Below

See Polynesian languages for more information about the Modifier Letter Turned Comma.

See Quotes and related symbols for more information on available punctuation.

See Understanding modifier key notation for an explanation of modifier codes.

Serbo-Croatian

The Q Keyboard fully supports the Serbo-Croatian group of languages which includes Bosnian, Croatian, Montenegrin and Serbian when using the **Latin** alphabet. All letters in Gaj's Alphabet are available. That alphabet is also used in Slovenian (Slovene).

It is also possible to use Cyrillic for some of these languages, but because the Q Keyboard's support for Cyrillic depends entirely on **Dead Keys** and ***Held Keys***, typing long passages in Cyrillic would take additional effort.

Grave vowels **à À è È ì Ì ò Ò ù Ù** are produced as Live Keys with **BB** plus the native letter.

Caron letters **č Č š Š ž Ž** are produced as Live Keys with **AA** plus the native letter.

Letter **ć Ć** with Acute is on **CC C**

Letter **đ Đ** with Dash Stroke is on **CC D**

The **lj Lj LJ** digraph triples are on **AB L** and **BC L** and **AC L** respectively.

The **nj Nj NJ** digraph triples are on **AB N** and **BC N** and **AC N** respectively.

The **dž Dž DŽ** digraph triples are on **Live Keys AB D** and **BC D** and **AC D** respectively.

Where needed, the **dz Dz DZ** digraph triples are on **Live Keys AB R** and **BC R** and **AC R** respectively.

Note: All the letters above can also be produced as conventional Dead Keys. Refer to the Dead Key Guide for more information. Most typists will likely prefer using Live Keys for these, since they are faster and require less effort.

Double Grave letters **ȁ Ȁ ȅ Ȅ ȉ Ȉ ȑ Ȑ** are produced as Dead Keys with **AA 3** plus the native letter. Double Grave letters **ȍ Ȍ ȕ Ȕ** are produced as ***Held Keys*** with ***AA 3 O*** and ***AA 3 U*** respectively.

Inverted Breve letters **ȃ Ȃ ȇ Ȇ ȋ Ȋ ȏ Ȏ ȓ Ȓ ȗ Ȗ** are produced as Dead Keys with **AA 9** plus the native letter.

Letter combinations **dž Dž DŽ** can be typed as individual letters using **ž Ž** instead of the single-valued Unicode digraphs noted above. Likewise, digraphs **dz Dz DZ** can be typed as separate letters. This is often done when available fonts or keyboards do not support the digraphs.

See Quotes and related symbols for more information on available punctuation.

See Understanding modifier key notation for an explanation of modifier codes.

Spanish and Portuguese

The Q Keyboard fully supports the Spanish and Portuguese languages. These have regional spelling and orthographic variations, all of which are supported as **Live Keys**. Many languages in Central and South America use orthographies adapted from or similar to Spanish and Portuguese. Speakers of these languages should find the Q Keyboard easy to use.

Spanish and Portuguese keyboards are sometimes used to type French.

Acute vowels **á Á é É í Í ó Ó ú Ú** are produced as Live Keys with **CC** plus the native letter.

Tilde **ñ Ñ** is on **CC N**

Diaeresis **ü Ü** is on **Live Key AA U** • Letter **ü Ü** is only used occasionally. According to Wikipedia, in Spanish, "when **u** is written between **g** and a front vowel **e** or **i**, it indicates a "**hard g**" pronunciation. A diaeresis **ü** indicates that it is **not silent** as it normally would be."

Portuguese as a language bears similarities to Spanish, but also shows French influence by the accents it uses, which are more extensive than Spanish. See this Wikipedia article for more information.

Portuguese makes use of five diacritics, which are **ç with Cedilla**, **á é í ó** and **ú with Acute**, **â ê** and **ô with Circumflex**, **ã** and **õ with Tilde** and **à with Grave**.

Letter **ç Ç** with Cedilla is on **BB C**

Acute accents, **ü Ü** and **ñ Ñ** are noted above. Use of **ü Ü** in Portuguese has been officially discontinued, but it may be seen in older documents and in foreign loan words.

Circumflex vowels **â Â ê Ê î Î ô Ô û Û** are produced as Live Keys with **CC** plus the letter **G F J K H** from the Southwest Vowels row, respectively.

Tilde **ã Ã** and **õ Õ** as well as **ẽ Ẽ ĩ Ĩ** and **ũ Ũ** are produced as Live keys with **AB** plus the native letter for lower case, and **BC** plus the native letter for upper case.

Grave vowels **à À è È ì Ì ò Ò ù Ù** are produced as Live Keys with **BB** plus the native letter.

Note: All the letters above can also be produced as conventional Dead Keys. Refer to the

Dead Key Guide for more information. Most typists will likely prefer using Live Keys for these, since they are faster and require less effort.

The masculine ordinal º is on **AC O**

The feminine ordinal ª is on **AC A**

Inverted Exclamation ¡ is on **CL 1**

Inverted Question ¿ is on **CL /**

Some Spanish writers might wish to use the interrobang ⸘ on **BC 1** in addition to ‽ on **AC /**

Some languages in Mexico and Central and South America may use the **Saltillo** punctuation marks ' and ˈ as glottal stops. See this Help article for more information.

See Quotes and related symbols for more information on available punctuation.

See Understanding modifier key notation for an explanation of modifier codes.

Turkish

The Q Keyboard fully supports Turkish, and Turkic languages related to or derived from Turkish.

Diaeresis vowels **ä Ä ë Ë ï Ï ö Ö ü Ü** are produced as Live Keys with **AA** plus the native letter.

Circumflex vowels **â Â ê Ê î Î ô Ô û Û** are produced as Live Keys with **CC** plus the letter **G F J K H** from the Southwest Vowels row, respectively.

(It is understood that Turkish does not use all the letters listed above.)

Letter **ç Ç** with Cedilla is on **BB C**

Letter **ş Ş** with Cedilla is on **BB X** • Letter **ș Ș** with **Comma Below** is on **BB S**

Letter **ğ Ğ** with Breve is on **AA G**

Letter dotless small **ı** and dotted letter capital **İ** are on **AA J**

When needed, letter **ţ Ţ** with Cedilla is on **AB T** and **BC T** • Letter **ț Ț** with **Comma Below** is on **BB T**

Note: All the letters above can also be produced as conventional Dead Keys. Refer to the Dead Key Guide for more information. Most typists will likely prefer using Live Keys for these, since they are faster and require less effort.

> Using the Comma key, typing **S** and **T** as **Dead Key** letters will produce the **Cedilla** accent, while typing them as ***Held Key*** letters will produce the **Comma Below** accent. That is in keeping with the primary purpose of the dead key diacritic on the comma key, which is for the Cedilla accent. By defining the Live Keys and Dead/Held keys this way, users of both **Cedilla** S and T and **Comma-Below** S and T have their needs considered. This also takes into account that across languages, these four letters **Ş Ţ Ș Ț** do not appear with the same frequency, as letter **T with Cedilla** is used less often.

When needed, letter Schwa **ə Ə** is on the **BB** ` (grave) **Live Key** and on **Dead Key AA X X**.

For the Turkish-specific letters **ı** and **İ** the **Dot Above** dead key **AA . I** will **remove** the dot from lower case **i** giving **ı** and **add** it to the upper case **I** giving **İ** • Note that in Turkish, the dotted letters **i İ** and dotless letters **ı I** are paired together, which differs from English where **i** and **I** are paired.

See Quotes and related symbols for more information on available punctuation.

See Understanding modifier key notation for an explanation of modifier codes.

UK keyboard

The Q Keyboard fully supports the characters present in the standard United Kingdom (UK) QWERTY keyboard. This keyboard closely resembles a U.S. QWERTY layout, except that some special characters are in different locations.

For more information on this subject, see https://en.wikipedia.org/wiki/QWERTY and select section **4.2.23** from the table of contents. Under this heading, the more interesting design is the United Kingdom **Extended Layout**, in section **4.2.23.2**. In Windows, this layout is known as Welsh (United Kingdom), because this variant of the UK keyboard has all of the diacritics needed to type Welsh.

UK-specific characters can be produced on the Q Keyboard using the **CC** modifier, whereas on a UK keyboard they would have required an **AltGr** key. Some Welsh-specific letters require a **Dead Key** with the **AA** modifier. See the Welsh article (next) for more information.

Acute letters **á Á é É í Í ó Ó ú Ú** are produced as Live Keys with **CC** plus the native letter.

Logical Not symbol **¬** is on **CL 6**

Broken Bar symbol **¦** is on **CL **

British Pound symbol **£** is on **CL 3**

Euro Currency symbol **€** is on **CL 4** • (NBSP+€) **CU 4** • ***AL [E***

Other special characters are on preprinted U.S. key positions, which differ in some cases from the UK keyboard.

Note: The Acute letters above can also be produced as conventional Dead Keys. Refer to the Dead Key Guide for more information. Most typists will likely prefer using Live Keys for these, since they are faster and require less effort.

See Quotes and related symbols for more information on available punctuation.

See Currency symbols for more information on other available currency symbols.

See Understanding modifier key notation for an explanation of modifier codes.

Welsh, Irish and Scots

The Q Keyboard fully supports the Welsh, Scots and Irish languages. Those who use such languages may occasionally require Archaic and lesser-used letters. See that article for more information.

Acute vowels **á Á é É í Í ó Ó ú Ú ý Ý** are produced as Live Keys with **CC** plus the native letter.

Acute **ẃ Ẃ** is is only available as a Dead Key.

Grave vowels **à À è È ì Ì ò Ò ù Ù ỳ Ỳ** are produced as Live Keys with **BB** plus the native letter.

Grave **ẁ Ẁ** is only available as a Dead Key.

Diaeresis vowels **ä Ä ë Ë ï Ï ö Ö ü Ü ÿ Ÿ** are produced as Live Keys with **AA** plus the native letter.

Diaeresis **ẅ Ẅ** is produced as a Live Key with **AB Q and BC Q**, respectively.

Circumflex vowels **â Â ê Ê î Î ô Ô û Û** are produced as Live Keys with **CC** plus the letter **G F J K H** from the Southwest Vowels row, respectively.

Circumflex **ŵ Ŵ** is produced as a Live Key with **AB W** and **BC W**, respectively.

Circumflex **ŷ Ŷ** is produced as a Live Key with **CC V**

Note: All the letters above can also be produced as conventional Dead Keys. Refer to the Dead Key Guide for more information. Most typists will likely prefer using Live Keys for these where available, since they are faster and require less effort.

For the assistance of Welsh writers, **ŵ Ŵ** with Circumflex, and **ẁ Ẁ** with Grave accent, can additionally be typed using **AA [W** and **AA] W** as convenience Dead Key letters. This allows all four types of Welsh W letters (and other Welsh letters also) to be accented using the cluster of keys **[ ] ;** and **'** that are near each other on the right side of the keyboard.

To type the U+204A **Tironian Et** sign ⁊ hold **AA** and press **7**, then release **AA** and type **7** a second time. This is an archaic letter sometimes used in Ireland and Scotland to mean "**and**". Note the resemblance between the Tironian Et and the digit 7.

The Q Keyboard also supports two letters from Middle Welsh, which are present in few fonts:

- The letter ỉỉ ℾ Middle Welsh **LL** is on **AA 8 L**

- The letter ꝟ ꝟ Middle Welsh **V** is on **AA 8 6**

Irish

Modern Irish primarily uses **Acute** accents on vowels, described above. Older Irish orthography used Dot Above for the following letters, which can be typed using **Dead Key AA .** (period):

ḃ Ḃ ċ Ċ ḋ Ḋ ḟ Ḟ ġ Ġ ṁ Ṁ ṗ Ṗ ṡ Ṡ ṫ Ṫ

Letter **ċ Ċ** is also on **Live Key AB C** and **BC C**
Letter **ġ Ġ** is also on **Live Key BB **

Archaic Irish used **Insular** letters. Insular letters available on the Q Keyboard are defined on Key 08.

Scots

Scots does not use diacritics extensively. At times, Grave and Acute accents are used.

In some variants of Scots, the letter ȝ ȝ **Yogh** appears. **Yogh** is found on **AA 8 3**

As an archaic letter, **Yogh** is present in few fonts, and some that do have it (like Calibri) may incorrectly render Yogh the same as the letter **ʒ 3 Ezh**. When it is important to make a distinction, there are fonts that clearly show these differently. Ones that you can try are Gentium Plus, Roman Cyrillic Std and DejaVu Sans.

See Quotes and related symbols for more information on available punctuation.

See Understanding modifier key notation for an explanation of modifier codes.

Part 6: Support for Vietnamese

This section describes how the Q Keyboard supports the Vietnamese language, one that has a challenging script with a large number of dual-accented vowels. While not as efficient as a native Vietnamese keyboard, the Q Keyboard should be practical enough to use for casual typing of brief passages of Vietnamese words.

Introduction to Vietnamese support

The Vietnamese language, with its numerous accented letters, is a challenge for any keyboard. Many keyboard designs and typing schemes have been devised over the years, some more successful than others.

The Q Keyboard fully supports Vietnamese, by seamlessly integrating these many accented letters into its design through the use of **Live Keys**, **Dead Keys** and ***Held Keys***. The resulting layout is an efficient one, consistent with how other similar accented letters are produced on this keyboard.

All of the Vietnamese letters described in this section are produced as single, precomposed Unicode characters. It is also possible to compose Vietnamese letters using combining modifier symbols for accent marks and/or tone marks, and to use those diacritic marks for other, non-Vietnamese purposes. Because of the additional effort involved, this would probably not be something typically done by the average typist, but is a technique occasionally used by linguists and scholars. See the section Combining modifiers for Vietnamese for more information on this topic.

Is the Q Keyboard as efficient as a native Vietnamese keyboard for these letters? Not in all cases. Contemporary native Vietnamese keyboards have eight dedicated keys, which include 6 accented vowels, the consonant **Đ** and the **₫** Dong currency symbol, and these do not use the **AltGr** key. To compensate for all of the dedicated keys taken for this purpose, the upper row of numbers and punctuation require the **AltGr** key to access them. So, the native keyboard sacrifices ease-of-use for those numbers and punctuation symbols in exchange for efficient typing of the language itself. For a keyboard that is dedicated to a single language (a difficult one), that is a perfectly reasonable design choice. For Vietnamese typists that also need to type digits extensively, a full-size keyboard with a numeric pad would address that need (much as is done with the French AZERTY).

However, to fulfill its role as an international keyboard, and not just one for a particular language or region, and to maintain U.S. QWERTY compatibility, the Q Keyboard cannot set aside eight dedicated keys in that way. For the same reasons, it cannot avoid the use of its unique modifier keys **AA**, **BB** and **CC** to produce non-English letters. That means, in a side-by-side comparison, it will sometimes require one keystroke more to produce the same Vietnamese letter on a Q Keyboard than on a native keyboard.

> While the Q Keyboard is slightly less efficient than a native keyboard to produce Vietnamese, a native Vietnamese keyboard is itself not well-suited for typing international letters of non-Vietnamese languages. (Their keyboard is close to supporting French and Spanish, but some letters and symbols are missing.) Vietnamese speakers also need to type letters that are not part of their own language, for international commerce and other reasons. Because of that, even with the admitted slight inefficiency, many of them could still benefit from using the Q Keyboard.

Vietnamese words also contain non-accented Latin letters, and single-accented letters that can be quickly typed as Live Keys. Because only some letters are on Dead Keys and Held Keys, and because not every Vietnamese letter needs special handling, it will take less effort than typing Cyrillic letters. You should find that the Q Keyboard is competitive with native Vietnamese keyboards, at least for modest amounts of text. The goal of this design is not necessarily to replace native keyboards, but to provide an acceptable level of efficiency once users gain practice and experience using the Q Keyboard.

Note: The letter **B with Flourish** Ƀ ƀ was part of the **Middle Vietnamese** alphabet in the 17th century. That letter is archaic and obsolete. Its role in modern Vietnamese is now served by the letter **V**. Letters with Flourish and Squirrel Tail are available on **AA 7**. If you wish to use Letter B with Flourish, it is typed as **Dead Key AA 7 B**.

Precomposed vs. combining accents

Because of the large number of accented letters in Vietnamese, and the desire to make typing them as easily as possible, a number of techniques have been devised over the years to enter these letters.

Some techniques go beyond the keyboard alone, and utilize an Input Method Editor, or **IME**. An IME adds a software layer to interpret strings of characters rather than just looking at individual keys.

As a standard keyboard device driver, the Q Keyboard cannot emulate an IME, but for those accustomed to entering Vietnamese without an IME, it should provide competitive performance.

A well-known standard for Vietnamese keyboards is called **TCVN 6064:1995**. A description of an implementation of this standard by IBM can be found here:

ftp://ftp.software.ibm.com/software/globalization/keyboards/KBD461.pdf

This document provides some useful information on the TCVN standard. The accents which appear on keys 05 through 09, as well as circumflex and diaeresis, are described with a "Y flag" to indicate they are "dead keys" but they also contain the comment that these accents are used **after** the base character rather than beforehand. Additionally, the accents in question are shown with their code point values, which are from the **U+03xx** block of Unicode, and thus are all combining modifiers.

From this, it is evident that the TCVN 6064:1995 standard, at least as IBM implemented it, does not really use true dead keys, but **combining accents**. That means every dual-accented letter creates two code point values - one for the base letter and one for the combining accent that follows.

> That is, the TCVN hardware standard **alone** does not directly use Dead Keys to create precomposed letters. It is possible that a TCVN keyboard could be operated in conjunction with an IME software layer which converted a letter followed by one or two combining modifiers into a single precomposed letter. Consideration of IME software is beyond the scope of the Q Keyboard project.

In contrast, the Q Keyboard uses ***Held Keys*** (a type of Dead Key) for these letters, so that they are all precomposed as single Unicode values.

That differs from the TCVN 6064:1995 hardware standard - which could be a good or bad thing, depending on your needs. The Q Keyboard approach will produce a different but more-compact data stream. However, that data stream will not be the same as the TCVN hardware standard. According to Unicode rules, such streams are supposed to be "equivalent" by Unicode-conformant software. In practice, software may or may not properly implement the logic to correctly recognize two different data streams as

equivalent. It is certainly possible to add modifiers manually, as is described here, but it would be much more labor-intensive, since that is not the way Vietnamese support was intended to be used on the Q Keyboard.

> It is possible that operating systems, such as Windows, when configured to run with Vietnamese as its main language, might automatically convert letters and combining modifiers corresponding to Vietnamese letters into their more-compact precomposed forms. You would have to consult your operating system's vendor to confirm whether that is the case or not.

Users wishing to enter Vietnamese with the Q Keyboard should find that the number of keystrokes and amount of effort is roughly the same as a TCVN 6064:1995 keyboard, but the key locations and typing order will be different. Based on those differences, you would have to evaluate whether its support for Vietnamese is suitable to your needs.

A note about QWERTZ and AZERTY variants

Users of QWERTZ and AZERTY regional layout variants need to be aware of the following:

- The **QWERTZ** variant layout of the Q Keyboard exchanges the roles of the **Y** and **Z** keys.
- The **AZERTY** variant layout of the Q Keyboard exchanges the roles of the **Q** and **A** keys, and the roles of the **W** and **Z** keys.

Because Vietnamese accented letters require the use of the **Q**, **Y**, and **A** keys, the QWERTZ and AZERTY variants will affect how these keys are used.

A variant layout completely swaps the keys involved. So, to type the letter **ă** on the AZERTY variant, you would hold the **AA** key and type the physical **A** key, rather than the physical **Q** key that would be pressed when using the QWERTY or QWERTZ variant. To type the letter **ý** on the QWERTZ variant, you would hold the **CC** key and type the physical **Z** key, rather than the physical **Y** key. The same considerations apply to **dual-diacritic** Vietnamese letters using **Q**, **Y**, and **A**.

> When considering variant layouts, we say you are typing with ***Logical Key Q*** to type letter **ă Ă** regardless of what ***Physical Key*** is being used for **Logical Key Q**. Likewise, to type letter **ý Ý** you use ***Logical Key Y***.

While native Vietnamese keyboards use a QWERTY layout, the choice of using an AZERTY or QWERTZ variant is up to the user. Regardless of the variant used, the Q Keyboard fully supports all Vietnamese letters equally well on all of the variant layouts.

Overview of Vietnamese orthography

For those unfamiliar with the Vietnamese alphabet, the following summary may be helpful.

The letters **A E I O U** and **Y** are vowels. Vietnamese also contains six accented vowels and one accented consonant, which are considered distinct letters of the alphabet:

- **ă Ă** with Breve
- **â Â** with Circumflex
- **ê Ê** with Circumflex
- **ô Ô** with Circumflex
- **ơ Ơ** with Horn
- **ư Ư** with Horn
- **đ Đ** with Stroke (not to be confused with the similar **ð Ð** letter Eth in languages like Icelandic)

There are thus six accented vowels and six unaccented vowels, for a total of 12. The Horn accent is used primarily in Vietnamese, but is also seen in other lesser-used languages.

All vowels, whether accented or not, can be used either alone or with an additional diacritic known as a Tone Mark. There are five tone marks, these being the ` Grave, ̉ Hook Above, ̃ Tilde, ´ Acute and **.** Dot Below. (There is also a sixth tone in the language that is unmarked.) The Hook Above mark is unique to Vietnamese, while the remaining marks are also used in many other languages. Vietnamese does not consider a letter with a tone mark, and the same letter without a tone mark, to be two different letters.

> Treatment of accent marks varies from one language to the next. Some view accented letters as separate letters in their own right, and others treat them as variations of unaccented letters. These choices are seen in each language's roster of letters, and how they are handled for sorting purposes, such as in dictionaries. The question of whether **Unicode** considers accented letters as unique vs. whether a **language** treats them as unique are two different issues.

Since there are 12 vowels, and 6 possible tones, and two letters each for upper and lower case, that makes 12 x 6 x 2 = 144 distinct glyphs for Vietnamese vowels, plus the letter **đ Đ**. *That is a lot*, and that's what makes it such a challenge to design a keyboard for it.

> Aside from the **Đ** with stroke, the other Vietnamese consonants do not use accents or tone marks. Because of French influences, Vietnamese text may sometimes contain French letters such as **Ç Æ** and **Œ**, and may also contain international letters in foreign loan words. These are not part of Vietnamese *per se*, but are occasionally used by Vietnamese typists. Likewise, English letters F, J W and Z do not appear in native Vietnamese, but may appear in foreign loan words.

The Vietnamese **đ̲** Dong currency symbol will be recognized as an underlined lower-case **đ** with Dash Stroke. It is possible to simulate a Dong by putting a Line Below symbol under a **đ** letter, but it would not look quite the same (and probably not as good) as a precomposed **đ̲** Dong character.

Producing D with Stroke and the Dong currency

The **đ Đ** with Dash Stroke can be produced in one of two ways:

As Live Keys

Use **CL D** to type **đ**
Use **CU D** to type **Đ**

Be careful **not** to use the **BB** modifier for this letter, since that will produce the unrelated letter **ð Ð Eth** instead. In the upper-case form, these two letters appear identical, but have different Unicode code-point values. The capital "African D" on **AU M D** also looks like **Đ** but again is an unrelated letter.

As Dead Keys

Use **AL – D** to type **đ**
Use **AU – D** to type **Đ**

The **₫** Dong currency symbol **U+20AB** can be produced in one of two ways:

As a Live Key

Use **AC U** to type **₫**
(Holding **AA** and **CC**, type **U** key)

As a Held Key

- Press and hold **AA**
- Type **[** key
- Type **D** key; symbol **₫** appears
- Release **AA**

See Understanding modifier key notation for an explanation of modifier codes.

See Currency symbols for more information about how ***Held Key*** currency symbols are typed. Users that type this symbol frequently will likely prefer typing the Dong symbol as a **Live Key**, while those with only occasional need of it might like the Held Key version better because it's easier to remember.

Producing the accent-only vowels

As Live Keys

The vowels with Circumflex use the **CC** modifier with three of the Southwest Vowel keys; the others use the **AA** modifier with various keys. On a hardware-defined Q Keyboard, these keys would have supplemental keycap legends with the accented letters shown below.

Key	Q	G	F	K	B	V
Key+CC		**â Â**	**ê Ê**	**ô Ô**		
Key+AA	**ă Ă**				**ơ Ơ**	**ư Ư**

As Dead Keys

All Dead Keys use the **AA** modifier plus an optional Shift. As with other Dead Keys on the Q Keyboard, you can use either Early Shift or Late Shift to type upper-case letters. See Capitalization rules for more information.

Letters **ơ Ơ** and **ư Ư** were put on the Cedilla Dead Key, since there are no such letters as **O** or **U** with Cedilla, so this does not conflict with the normal use of Cedilla. Also, the Horn accent somewhat resembles a **,** Comma where the Cedilla Dead Key is located.

First, hold **AA** and type:	Then, release **AA** and type one of:	To produce
0) key	**a A**	**ă Ă**
6^ key	**a A**	**â Â**
6^ key	**e E**	**ê Ê**
6^ key	**o O**	**ô Ô**
,< key	**o O**	**ơ Ơ**
,< key	**u U**	**ư Ư**

Producing the tone-only vowels

As Live Keys

The ` **Grave**, ˜ **Tilde** and ´ **Acute** tones can be produced with Live Keys or Dead Keys. The **. Dot Below** and ̉ **Hook Above** tones can ***only*** be made with Dead Keys. Remember that **AB** means to hold **AA** and **BB** together; **BC** means to hold **BB** and **CC** together.

Key	A	E	I	O	U	Y
Key+CC	á Á	é É	í Í	ó Ó	ú Ú	ý Ý
Key+BB	à À	è È	ì Ì	ò Ò	ù Ù	ỳ Ỳ
Key+AB	ã	ẽ	ĩ	õ	ũ	ỹ
Key+BC	Ã	Ẽ	Ĩ	Õ	Ũ	Ỹ

As Dead Keys

All of the Dead Keys work the same way for every base letter **A E I O U** and **Y.** Letter **A** is shown here as an example; use the same procedure for **E I O U** and **Y**. See Capitalization rules for more information on how to include Shift with Dead Keys.

For tone mark of type:	First, hold **AA** and type:	Then, release **AA** and type one of:	To produce
Grave	**`~ key**	a A	à À
Hook	**7& key**	a A	ả Ả
Tilde	**1! key**	a A	ã Ã
Acute	**' " key**	a A	á Á
Dot Below	**| key**	a A	ạ Ạ

Note: While the QWERTY **`~** key contains **both** a grave accent and a tilde as keycap legends, as a Dead Key it is **only** used for its role as a **Grave** accent. You must use its neighbor key **1!** for the **Tilde** Dead Key.

See Understanding modifier key notation for an explanation of modifier codes.

Producing dual-diacritic vowels

Consistent with how other dual-diacritic letters are produced on the Q Keyboard, Vietnamese letters with both a tone mark and an accent mark must be typed as ***Held Keys***. See the article on Held Keys for more information on this topic.

> **Note**: The Q Keyboard defines other, **non**-Vietnamese dual diacritics that are not listed here. Consult Dual Diacritic Held Key Guide for a table showing every Dual Diacritic letter for every Dead Key, which includes Vietnamese letters.

To type a Vietnamese letter with two diacritics, you **first** type **AA** and the **tone mark** key, and then a base **letter** key that has an implied accent mark, **in that order.**

The **tone mark** keys are the same as used for typing single-tone letters using Dead Keys. Those tone mark keys are as follows:

For dual diacritics with tone mark of type:	First press and **continue to hold AA**, and type:
Grave	**`~ key**
Hook	**7& key**
Tilde	**1! key**
Acute	**' " key**
Dot Below	**| key**

The **base** letter keys are in the same locations that you **would** type for an accent-only **Live Key** letter. However, for **dual** diacritics, you only use the **AA** modifier key, not the **CC** modifier key. These base keys are:

Base key	**Q**	**G**	**F**	**K**	**B**	**V**
Base letter	**ă Ă**	**â Â**	**ê Ê**	**ô Ô**	**ơ Ơ**	**ư Ư**

As with all ***Held Keys***, the ***AA*** modifier key is **continuously held down** and not released until the final base key is typed.

Example: To type the letter **ắ** with a **breve accent and acute tone mark** as a ***Held Key***, you would do the following:

1. Because the tone mark is the Acute, you must start by using an Acute modifier sequence
2. Press and **continue to hold** the ***AA*** modifier key
3. Type the **' "** quote key, which is the Dead Key introducer for Acute accents
4. Type the **Q** key

Note that you type **Q** because that is the key you **would have** used to produce **ă with Breve accent** as a **Live Key** when typed as **CC+Q**

5. The letter **ắ** with Breve accent and Acute tone mark appears
6. Release the ***AA*** key

See Capitalization rules for more information on how to include Shift with Held Keys.

The procedure above is all you need to produce any dual-diacritic Vietnamese letter. To help you visualize how these rules work in practice, the next section details every possible combination of tones and accents.

See Understanding modifier key notation for an explanation of modifier codes.

Complete list of dual-diacritics

This section details the complete list of all dual diacritic letters **for Vietnamese** and instructions on how to type them.

> **Note**: The Q Keyboard defines other, **non**-Vietnamese dual diacritics that are not listed here. Consult Dual Diacritic Held Key Guide for a table showing every Dual Diacritic letter for every Dead Key, which includes Vietnamese letters.

All of the letters below are typed as ***Held Keys***.

Refer to the prior article Producing dual-diacritic vowels for instructions on the use of Held Keys in typing these Vietnamese letters. You may also wish to consult Held Keys for general information about Held Keys.

For dual diacritics with tone mark of type **Grave:**

First press and **continue to hold *AA***, and type	Then type letter and release ***AA***	To produce
`~ key	**q Q**	**ằ Ằ**
`~ key	**g G**	**ầ Ầ**
`~ key	**f F**	**ề Ề**
`~ key	**k K**	**ồ Ồ**
`~ key	**b B**	**ờ Ờ**
`~ key	**v V**	**ừ Ừ**

For dual diacritics with tone mark of type **Hook:**

First press and **continue to hold *AA***, and type	Then type letter and release ***AA***	To produce
7& key	**q Q**	**ẳ Ẳ**
7& key	**g G**	**ẩ Ẩ**
7& key	**f F**	**ể Ể**
7& key	**k K**	**ổ Ổ**
7& key	**b B**	**ở Ở**
7& key	**v V**	**ử Ử**

For dual diacritics with tone mark of type **Tilde:**

First press and **continue to hold *AA***, and type	Then type letter and release ***AA***	To produce
1! key	**q Q**	**ẵ Ẵ**
1! key	**g G**	**ẫ Ẫ**
1! key	**f F**	**ễ Ễ**
1! key	**k K**	**ỗ Ỗ**
1! key	**b B**	**ỡ Ỡ**
1! key	**v V**	**ữ Ữ**

For dual diacritics with tone mark of type **Acute:**

First press and **continue to hold *AA***, and type	Then type letter and release ***AA***	To produce
' " key	**q Q**	**ắ Ắ**
' " key	**g G**	**ấ Ấ**
' " key	**f F**	**ế Ế**
' " key	**k K**	**ố Ố**
' " key	**b B**	**ớ Ớ**
' " key	**v V**	**ứ Ứ**

For dual diacritics with tone mark of type **Dot Below:**

First press and **continue to hold *AA***, and type	Then type letter and release ***AA***	To produce
| key	**q Q**	**ặ Ặ**
| key	**g G**	**ậ Ậ**
| key	**f F**	**ệ Ệ**
| key	**k K**	**ộ Ộ**
| key	**b B**	**ợ Ợ**
| key	**v V**	**ự Ự**

Combining modifiers for Vietnamese

Every accent mark and tone mark that appears on Vietnamese vowels can be applied separately using Combining Modifier symbols, instead of using precomposed letters. Because of the additional effort involved, this is not something typically done by the average typist, but is a technique occasionally used by linguists and scholars.

> For nearly all fonts, if precomposed Vietnamese letters are available it is preferable to use them, because they have a better appearance than adding combining modifiers to base letters. Precomposed letters work better and do not exhibit the alignment, formatting and rendering problems often associated with the use of combining symbols.

The success of this technique is dependent on the quality of the fonts you use, so it is important to test your fonts to ensure they behave as you expect them to. See Font issues for more information.

The list below covers all the diacritic marks appearing on Vietnamese vowels. For a comprehensive list of all combining modifiers, see Combining Diacritics, Avoiding Combining-Diacritic Mistakes and Combining Diacritic List for more information.

For clarity, the tables below show these accents on a sample letter of o even though the letters you would add accents to will be different.

For combining mark of type:	Hold AA and type this key twice:	To produce
Breve	0) key	ŏ
Circumflex	6^ key	ô
Grave	`~ key	ò
Hook	7& key	ỏ
Tilde	1! key	õ
Acute	' " key	ó
Dot Below	| key	ọ

There are also two "convenience combining marks" that are useful for Vietnamese letters, which can be used instead of the corresponding combining marks shown above.

For combining mark of type:	Press and hold AA key and first type:	Then while still holding AA, type:	To produce:

Horn Above	**. key**	**, key**	**ơ**
Dot Below	**, key**	**. key**	**ọ**

Part 7: Support for Cyrillic

This section describes how the Q Keyboard supports the Cyrillic alphabet, in use by some 300 million speakers. (Usage figures are round numbers; estimates vary.) The Q Keyboard supports some 110 Cyrillic-based languages, of which Russian is perhaps the most prominent example. **Update**: The most recent survey done in February 2019 confirmed support for 130 Cyrillic languages.

The issues surrounding the use of Cyrillic are similar to those for Vietnamese, compounded by the fact that Cyrillic languages do not use any Latin letters at all. Even ones like **E** that **resemble** Latin are different Unicode values. That means every Cyrillic letter you use must be typed as a **Dead Key** or ***Held Key***.

The Q Keyboard will not be as efficient as a native Cyrillic keyboard, but with practice, it should be good enough to use for casual typing of brief passages, proper names, geographic locations, and so on.

In time, you should eventually become proficient enough at typing Cyrillic that it will be faster and preferable to picking letters from a Character Map or Insert Symbol popup dialog, which likely would have been your only alternative. If that proves true for you, then the purpose behind Cyrillic support on the Q Keyboard will have been well served.

This document generally uses the Calibri font to display Cyrillic letters in the Dead Key Guides, to be consistent with the rest of the Help. When Calibri is missing a particular glyph or doesn't do a good job of rendering it, the Roman Cyrillic Std font is used instead. For instance, many fonts render the I-like **U+04C0 Cyrillic Letter Palochka** and **U+04CF Cyrillic Small Letter Palochka** identically, whereas Roman Cyrillic Std clearly shows **Small Letter Palochka** as shorter, helping to distinguish these two letters.

See the article Suggested fonts for more information.

A note about Cyrillic and italic fonts

When you use Cyrillic fonts in ***italic***, some lower-case letters may appear different than what you might expect.

For instance, in the font **Calibri**, a lower-case letter **г** ("Ge" or "Ghe") in Roman (non-italic) type is a small version of upper-case **Г** Ghe, which is typical for Cyrillic letters. Letter **Ghe** clearly shows its origins from the Greek letter Γ Gamma.

When that same letter appears in ***Calibri Italic*,** it is ***г*** which looks like a reversed **S**. In spite of the surprising appearance, this is correct. Several Cyrillic letters dramatically change form when rendered in italic font. The reasons for this are historical, involving

adaptations of traditional handwritten scripts.

> It is possible the shape of the italic Ghe was influenced by the Coptic letter ϩ Hori, which it resembles. Both Coptic and Cyrillic alphabets can trace their origins to Greek. Coptic Hori is pronounced like **H**, and the Cyrillic Ghe is often pronounced like **H** also. A similar issue may be observed in the Ukrainian **Hryvnia** currency symbol ₴ which originated from a word beginning with **Г** in Cyrillic. See this Wikipedia article for more information.

This transformation only happens for lower-case Ghe; in upper-case, italic letter Ghe is ***Г*** as expected.

The specifics of font rendering do not affect the Q Keyboard *per se*, but it is something to be aware of, so you would know that the keyboard was not malfunctioning when you see italic letters displayed this way.

A helpful article that explains this in more detail can be found here:
https://en.wikipedia.org/wiki/Cyrillic_script#Letterforms_and_typography

Introduction to Cyrillic support

Because the Q Keyboard is designed to support **Latin** languages, enabling the use of other scripts is necessarily a lower priority.

> For instance, the Q Keyboard makes the Greek alphabet available, both for regular letters and those with monotonic accents. This is helpful when entering math formulas or typing in languages that incorporate a few Greek letters in their own alphabets. To type Greek, you have to use a **Dead Key** or ***Held Key*** for every letter; there are no Greek letters on **Live Keys**. (There are four Greek-like math symbols on **Live Key M**, but they are not Greek letters *per se*.)

The issues are similar with Cyrillic, which also requires a Dead Key or Held Key for every letter, with these differences:

- You are more likely to type whole words in Cyrillic than to insert a few letters as symbols into a math formula. Use of Cyrillic letters in math formulas is not typical when they are part of Latin text.

- Some Romanized languages have a few Cyrillic letters, but not many.

Like Greek, there are no Cyrillic letters on Live Keys.

Given the limitations of supporting the Cyrillic alphabet on a Latin keyboard, who would use it? We have no way of knowing, and would not wish to make assumptions about the abilities of potential users, but the most likely user profile would probably be something like this:

- They might not speak Russian or any other Cyrillic-based language
- They may know few of the names of the Cyrillic letters (if any), or how they are pronounced
- Their knowledge of Cyrillic may be based almost entirely on the alphabet's appearance
- They might recognize a few letters:
  - those with glyphs like **А** that are identical to Latin
  - those that somewhat resemble Greek, such as Cyrillic **Д** De compared to Greek **Δ** Delta
- They may use the Cyrillic feature to copy words by rote, without necessarily understanding them
- Because of the foregoing, they would not be typing Cyrillic very often
- They could have entered these letters using a Character Map or an Insert Symbol dialog in a word processor, but would rather not do so, because that takes more effort and is time-consuming

A user of the Q Keyboard that fits the description above should find that, with practice, its support for Cyrillic is relatively easy once learned, and is better than using an Insert

Symbol dialog.

Assigning Cyrillic to Latin keys

The majority of Cyrillic letters are assigned to Dead Key W. The next most-used key for Cyrillic is on Dead Key 06. The remaining letters are on various keys. The Cyrillic Key Guide has a summary of all Cyrillic letters that are not on Dead Key W.

> Why is **W** the primary Dead Key for Cyrillic? Not for any clever, technical reason. It was mainly because the rest of the keyboard's resources are committed to other purposes, and this was the only remaining location available where a new Dead Key could readily be placed. The Latin letter W is seldom accented, so using W for Cyrillic does not adversely infringe upon other, non-Cyrillic uses of that key.
>
> If you happened to be typing Cyrillic on an AZERTY Regional Variant, the keys **W** and **Z** are swapped, so the logical **W** key is where the physical **Z** key is.

How do assumptions about likely users affect the way Cyrillic letters are assigned to Latin keys on the Q Keyboard? Assignments are based (where possible) primarily on a letter's ***appearance*** rather than attempting to associate a letter with its underlying ***sound***.

> That it different than how **Greek** is handled, which *does* associate letters with sounds, so that Greek **Rho ρ** goes on the **R** key, not the **P** key. The Q Keyboard generally follows conventional Greek keyboard layouts in doing that.
>
> No attempt was made to make key assignments compatible with any existing Cyrillic keyboard. That is because there are many different kinds of Cyrillic keyboards and they are not mutually compatible. Also, the Q Keyboard supports multiple Cyrillic-based alphabets (such as Russian, Serbian and Bulgarian), not just one.
>
> Even if we arbitrarily decided to conform to one standard (say, Russian), not only are Russian keyboards different than other Cyrillic keyboards, but not even all Russian keyboards are the same. And, the Q Keyboard has to support far more letters than the Russian keyboard or any other single Cyrillic keyboard does. That is why Cyrillic support on the Q Keyboard is not modeled after Russian or any other national keyboard.

Here is how some letters are typed:

- The Cyrillic letter **Ц Tse** resembles a squared-off Latin letter **U**. So, **Tse** is on **AA W U**
- The Cyrillic letter **Ч Che** resembles the digit 4 when written with an open top. Of course it's not the digit 4, but it does *look* like one. So, to type **Che** you use **AA W 4**
- The letter **Ѳ** is a Cyrillic Barred O. Because the Latin letter **Q** is an "O" letter with a (partial) line in the middle of it, it may be easier to make the association. So, **Ѳ** is on **AA W Q**

- Letters **Д** and **Л** are Cyrillic **De** and **El**. We take advantage of the fact that **Д** and **Л** resemble Greek letters **Δ** Delta and **Λ** Lambda (since these Cyrillic letters were derived from Greek), and that many persons are familiar with the Greek alphabet. This allows us to place **Д** on the **D** key, and **Л** on the **L** key.

It is necessary to use both **Dead Keys** and ***Held Keys*** to support the extensive list of letters. Be sure you understand the concepts regarding Held Keys.

Wherever possible, letters have been "paired" to help you remember them, and effort was made to organize this pairing to be consistent and to follow a common pattern, when the available room allowed for it. The "pairing" works like this:

- a letter considered to be unmodified or "simple" gets assigned as a Dead Key
- a letter with an accent, marking or "something extra" gets assigned as a Held Key

Examples:

- Dead Key **AA W N** is **и И** while Held Key ***AA W N*** is **й Й**
- Dead Key **AA W L** is **л Л** while Held Key ***AA W L*** is **ӆ Ӆ**

Here, the "something extra" on **И** is a Diaeresis, while on **Л** it is a Descender.

> As a rule, Cyrillic tends to apply Diaeresis to vowels and Descender to consonants. As with much of Cyrillic, use of Descenders can get complicated. For instance, in addition to the standard **л Л** Cyrillic **El** you can find **straight descenders ӆ Ӆ** and **hooked descenders ԛ Ԛ** and **angled descenders ԝ Ԝ** ("with tail") and **middle-hook descenders ԉ Ԉ** and a related letter **ѵ Ѵ** called a **Soft El** having a mark attached to the right side instead of underneath.

The Cyrillic alphabet is large. A survey of every Unicode character and symbol containing the word "Cyrillic" turned up 435 entries. If we limit that to only ones officially called "letters" and not count "modifiers" or "combining symbols", there are still 360 of them. The Q Keyboard has support for 326 different Cyrillic characters.

> The number 326 comes from 159 pairs of upper and lower case letters, 5 Cyrillic combining accent and 3 Cyrillic Modifier Letters, those being the Modifier En, Modifier Hard Sign and Modifier Soft Sign.
>
> The Unicode Consortium gets proposals all the time to add new letters, some of which may be Cyrillic. It is likely there will be more than 435 Cyrillic letters defined eventually. Based on past history, proposals for new Cyrillic letters will almost certainly pertain to archaic letters, not for ones that are in active use. If ancient Cyrillic documents are discovered one day and are found to contain letters not yet in Unicode, some scholar will eventually petition for them to be added.

The Cyrillic letters that were **not** implemented are from Unicode ranges called Extended

and Supplement. These letters are archaic or seldom-used and appear in fewer fonts.

A close look at the Cyrillic Key Guide will show that there are in fact many Extended and Supplement letters included, just not all of them. You should not be overly concerned that some letters are excluded. A careful analysis of the letter usage of 130 Cyrillic-based languages confirmed that the Q Keyboard fully supports all of them, and no required letters were missing. Even the specialized, archaic letters of Old Church Slavonic are available. It is just that certain variants of some archaic Cyrillic letters are not used any more, except for linguistic, historical and research purposes, such as transcribing very old documents that are written in archaic languages. If you are typing a modern Cyrillic language that is in active use, the Q Keyboard has you covered.

There are so many letters that nearly every possible key on **AA W** is taken up by them. Even that was not enough, so **AA 6** is used to handle the extra letters that wouldn't fit on **AA W**. As noted above, there are also various Cyrillic letters scattered around the keyboard. The specific places were chosen in the hope that you would better remember where they are located.

If you look at the Russian keyboard article, you will see that many of the more common Cyrillic letters actually ***are*** relatively easy to remember. For instance **я Я** is on **AA W R**, and **ц Ц** is on **AA W U**.

Some of these letters will take more effort to remember than others. There is no choice but to read and review the documentation. Not all of this going to be intuitive. It will take a little work and study.

Will any of the remaining 109 Cyrillic letters get implemented? If there is user feedback indicating a demand for them, it's possible. However, a large number of contemporary Cyrillic-based languages have been carefully reviewed and analyzed (the first list had 110 of them, and a second list had 130), and they are fully supported by the current design. No evidence was found that the other letters were needed. See the next article about Cyrillic languages supported for more information.

Those 109 unsupported letters are used primarily by linguists and for transcribing archaic Slavonic texts. It is unlikely you would need them in everyday use. If it so happens that you did, you are welcome to contact the author about this or any other issues regarding the Q Keyboard. Because space on the keyboard is limited, any decisions to add new letters would have to be weighed carefully.

Example: There are some Y-like Cyrillic letters with Dash Stroke and with Macron. The key **AA W Y** already has its preferred keys assigned, so we need to put these somewhere else. So, they go on **AA –** and ***AA =*** as ***Held Key*** letters. This gives us:

- ***AL – Y*** **ɏ**
- ***AU – Y*** **Ɏ**
- ***AL = Y*** **ȳ**

- ***AU = Y*** **ȳ**

Cyrillic languages supported

The Q Keyboard should support the Cyrillic-based languages listed below, among others. Because so many languages use Cyrillic alphabets of one sort or another, an exhaustive list cannot be provided, and full coverage is not guaranteed. Some of the names below represent groups or **classes** of languages associated with a given region, rather than a specific one.

> The list below contains 110 named languages. Subsequent to the preparation of this article, additional information obtained from the Omniglot web contained alphabets for 130 languages, all of which are supported by the Q Keyboard. Because Omniglot is frequently updated, these additional languages were not added to the list below, but you can be confident that all modern Cyrillic languages in active use are well supported. Omniglot continues to be monitored, to ensure that the Q Keyboard's coverage of Cyrillic is as complete as possible.

If you have questions about any supported letters, you should consult the Dead Key guide for Key W and the Cyrillic key guide for all Cyrillic letters not on Key W.

For an example of the Q Keyboard being applied to a specific Cyrillic language, see Russian keyboard.

Because so many Cyrillic characters exist in Unicode (435), it was not possible to include all of them. Due diligence was exercised in attempting to include every letter in active use, and as many additional letters as would fit within the available resources. The additional letters included some archaic and seldom-used characters present in early Cyrillic, as well as five Cyrillic-specific combining accents and three Cyrillic modifier letters.

> Potential users of the Q Keyboard's Cyrillic feature must understand that this has been incorporated as a "best effort" research of available reference works. The author is not an expert or speaker of any Cyrillic-based language. While the roster of candidate letters was very carefully reviewed several times, it is possible that the final list of available letters may have omitted some that are present in one or more actively-used languages. If you find any cases where a required letter is not supported but is needed for a particular language, please contact the author.

Every Cyrillic letter present in the Windows WGL4 list is represented, including the four extra letters added in version 1.5 of the OpenType specification of May 2008. The extensive language list on Omniglot was also consulted, and the Q Keyboard appears to have these well-covered. Additional resources were also consulted to validate the letter selection list.

Some references were found to Cyrillic languages having letters not in Unicode, or using obscure or archaic letters, or constructed languages with limited usage, or languages where the alphabet definitions were unstable or unofficial. These were omitted from the

'officially' supported **list**, but because the inventory of Cyrillic letters that are supported is quite large, you should be able to type nearly everything you need, or possibly make substitutions in the few cases where the desired letter is unavailable. If you need such a letter only occasionally, using a Character Map may be enough.

Should any omissions be found in the supported list, it is possible that letters could be added in future editions of the Q Keyboard software.

For more information and a detailed letter inventory on some languages, consult the following:

https://en.wikipedia.org/wiki/Cyrillic_alphabets
http://www.omniglot.com/writing/langalph.htm#cyrillic

For more information about the WGL4 list, consult the following:

https://en.wikipedia.org/wiki/Windows_Glyph_List_4

Based on data from available reference works, the following languages should be supported. Note that Azeri is an abbreviation for Azerbaijani.

Abaza	Crimean Tatar	Khakas	Montenegrin	Tindi
Abkhaz	Dargwa	Khalkha	Nanai	Tofa
Adyghe	Dungan	Khanty	Nenets	Tsakhur
Aghul	Enets	Khinalug	Nganasan	Tsez
Akhvakh	Erzya	Khwarshi	Nivkh	Turkic
Altay	Even	Kildin Sami	Nogai	Turkmen
Andi	Evenki	Komi	Oroch	Tuvan
Archi	Gagauz	Koryak	Orok	Udi
Avar	Godoberi	Krymchak	Ossetian	Udmurt
Azeri	Hinukh	Kryts	Russian	Ukrainian
Bagvalal	Hunzib	Kubachi	Rusyn	Ulch
Balkar	Ingush	Kumyk	Ruthenian	Uralic
Bashkir	Iranian	Kurdish	Rutul	Urum
Belarusian	Itelmen	Kyrgyz	Serbian	Uyghur
Botlikh	Juhuri	Lak	Shor	Uzbek
Budukh	Kabardian	Lezgi	Shughni	Votic
Bulgarian	Kalmyk	Macedonian	Sino-Tibetan	Wakhi
Buryat	Karaim	Mansi	Tabassaran	West Polesian
Chamalal	Karakalpak	Mari	Tajik	Yaghnobi
Chechen	Karata	Moksha	Talysh	Yakut
Chukchi	Kazakh	Moldovan	Tat	Yukaghir
Chuvash	Ket	Mongolian	Tatar	Yupik

Cyrillic key guide

The following table shows every Cyrillic letter for every Dead Key, other than on Dead Key W, which only contains Cyrillic letters. This make it convenient to find these letters all in one place instead of having to search the entire Dead Key Guide to locate them.

When a key contains Cyrillic letters, most of them are shown as black letters on an orange background. The non-Cyrillic letters are grayed-out below, so they are visible but not a distraction.

Notice letter **ɑ Ɑ** on **AA 6 9**. This is **Latin Letter GHA**. In the Unicode documentation, it is officially known as Latin Letter **OI**. This has been recognized as a naming mistake, due to the resemblance of the symbol to the Latin Letters **O** and **I**, but it is pronounced more like a **G**. While GHA is considered Latin, it is often associated with languages that used Cyrillic in the past. Its use is on the decline, mostly being represented by versions of **G** in Latin alphabets, and **Г** or **Ғ** in Cyrillic ones. For more information on letter GHA, see this Wikipedia article. The Q Keyboard places GHA on key **9** because **Ɑ** looks somewhat like a digit **9** turned on its side. (The letter **ɑ** evidently originated from a hand-written variation of the letter **q**.)

Cyrillic letters with a green background can be confused with Latin. Use care when typing.

In a few cases, a Cyrillic character is a **modifier letter**. This is indicated by a medium blue background for the Unicode code point, and an orange background for the character itself, like this:

h	**H**	1E96	h̲			**1D78**	ᴴ		

For all the letters below, you can type upper case with Early Shift or Late Shift as you prefer. See Capitalization rules for more information.

QWERTY Keys		**AA Dead Key Symbols**				***AA Held Key Symbols***			
LC key	**UC key**	**AL u+**	**AL sym**	**AU U+**	**AU SYM**	**AL u+**	**AL sym**	**AU U+**	**AU SYM**
Dead Key 00 ` ~									
e	**E**	00E8	è	00C8	È	**0450**	**è**	**0400**	**È**
z	**Z**	**A641**	ꙁ̀	**A640**	Ꙁ̀	**A643**	**ꙁ̀**	**A642**	**Ꙁ̀**
n	**N**	01F9	ǹ	01F8	Ǹ	**045D**	**ѝ**	**040D**	**Ѝ**

Dead Key 01 1 !

0	)	044E	ю	042E	Ю	2152	⅒	23E8	
e	E	1EBD	ẽ	1EBC	Ẽ	0465	ѥ	0464	Ѥ
a	A	00E3	ã	00C3	Ã	A657	ꙗ	A656	Ꙗ

Dead Key 02 2 @

w	W	0461	ѡ	0460	Ѡ	047F	ѿ	047E	Ѿ
c	C					0481	ҁ	0480	Ҁ

Dead Key 05 5 %

r	R	0505	ԛ	0504	Ԛ	0507	ҋ	0506	Ҋ
t	T	A729	ꜩ	A728	Ꜩ	050F	ҭ	050E	Ҭ
d	D	0501	ԁ	0500	Ԁ	0503	ԣ	0502	Ԣ
k	K	2C6A	ⱪⱬ	2C69	Ⱪⱬ	051F	ҟ	051E	Ҟ
l	L					0509	ԙ	0508	Ԙ

Dead Key 06 6 ^

1	!	044B	ы	042B	Ы	04F9	ӹ	04F8	Ӹ
2	@	0454	є	0404	Є	0511	ԑ	0510	Ԑ
3	#					04E1	ӡ	04E0	Ӡ
4	$	04CC	ҍ	04CB	Ҍ	04F5	ӵ	04F4	Ӵ
5	%					0495	ҕ	0494	Ҕ
7	&					0491	ґ	0490	Ґ
9	(	01A3	ƣ	01A2	Ƣ				
0	)					0473	ѳ	0472	Ѳ
q	Q					04D5	æ	04D4	Æ
e	E	00EA	ê	00CA	Ê	04D7	ĕ	04D6	Ĕ
u	U	00FB	û	00DB	Û	A661	ꙋ	A660	Ꙋ
o	O	00F4	ô	00D4	Ô	047B	ѹ	047A	Ѹ
p	P					0517	ҡ	0516	Ҡ
a	A	00E2	â	00C2	Â	04D1	ă	04D0	Ă
h	H	0125	ĥ	0124	Ĥ	04BB	ҥ	04BA	Ҥ

j	J	0135	ĵ	0134	Ĵ	0529	ԩ	0528	Ԩ
k	K	049F	ҟ	049E	Ҟ	049D	ҝ	049C	Ҝ
l	L	0513	ԓ	0512	Ԓ	04C6	ӆ	04C5	Ӆ
v	V	0475	ѵ	0474	Ѵ	0477	ѷ	0476	Ѷ
b	B	0463	ѣ	0462	Ѣ	A64F	ꙟ	A64E	Ꙟ

Dead Key 07 7 &

1	!					A651	ꙑ	A650	Ꙑ
6	^	044C	ь	042C	Ь	044A	ъ	042A	Ъ
h	H	0527	ԧ	0526	Ԧ	04A5	ҥ	04A4	Ҥ

Dead Key 08 8 *

b	B	048D	ҍ	048C	Ҍ	0238	ȣ		

Dead Key 0A 0)

1	!	A655	ꙋ	A654	Ꙋ				
y	Y	028E	ʎ			045E	ў	040E	Ў

Dead Key 0B - _

y	Y	024F	ɏ	024E	Ɏ	04B1	ұ	04B0	Ұ
x	X					04FF	ӿ	04FE	Ӿ

Dead Key 0C = +

6	^					A69D	ᵇ	246F	⑯
y	Y	0233	ȳ	0232	Ȳ	04EF	ӯ	04EE	Ӯ
h	H	1E96	ẖ	0048	H	1D78	ʰ		
b	B	1E07	ḇ	1E06	Ḇ	A69C	ᵇ	2136	
n	N	1E49	ṉ	1E48	Ṉ	04E3	ӣ	04E2	Ӣ

Dead Key 1C \ |

2	@					A645	ꙅ	A644	Ꙅ

4	$	23AE				04B9	ч	04B8	Ч
r	R	1E5B	ṛ	1E5A	Ṛ	0519	æ	0518	Æ
y	Y	1EF5	ỵ	1EF4	Ỵ	04AF	ү	04AE	Ү
u	U	1EE5	ụ	1EE4	Ụ	A661	ꙋ	A660	Ꙋ
i	I	1ECB	ị	1ECA	Ị	04CF	ɪ	04C0	Ɪ
h	H	1E25	ḥ	1E24	Ḥ	045A	ҥ	040A	Ҥ
l	L	1E37	ḷ	1E36	Ḷ	0459	ҙ	0409	Ҙ
x	X	0353	̓			0515	ҳ	0514	Ҳ

Dead Key 29 ; :

k	K	2654	♔	265A	♚	04A1	ҡ	04A0	Ҡ

Dead Key 2A ' "

7	&	2447	⅋			0453	ѓ	0403	Ѓ
y	Y	00FD	ý	00DD	Ý	04F3	ӳ	04F2	Ӳ
d	D					A663	ꙍ	A662	Ꙍ
l	L	013A	ĺ	0139	Ĺ	A665	ꙗ	A664	Ꙗ
m	M	1E3F	ḿ	1E3E	Ḿ	A667	ꙙ	A666	Ꙙ

Dead Key 37 , <

3	#					0499	ҙ	0498	Ҙ
h	H	1E29	ḩ	1E28	Ḩ	04CA	ӈ	04C9	Ӈ
k	K	0137	ḳ	0136	Ḳ	045C	ҡ	040C	Ҡ
x	X					04FD	ҳ	04FC	Ҳ

Dead Key 38 . >

h	H	1E23	ḣ	1E22	Ḣ	0523	ԥ	0522	Ԥ
l	L	0140	ŀ	013F	Ŀ	0521	ԙ	0520	Ԙ
v	V	1E7F	ṿ	1E7E	Ṿ	04A7	ҧ	04A6	Ҧ

Part 8: Dead key guide

On the Q Keyboard, every digit key and every key with two punctuation symbols is used as a Dead Key diacritic. There are also three letter keys **W**, **X** and **M** used as Dead Keys, for a total of 24. These all require use of the **AA** modifier, plus an optional Shift key.

The letter keys **W**, **X** and **M** are like diacritic keys, but have no combining accents of their own directly associated with them. That is, a Grave accent symbol is associated with the Grave dead key, but there is no such thing as a "Miscellaneous" accent. These keys have other, unrelated symbols, or may have nothing defined because the key sequences are not needed.

- **W** is the primary Dead Key for Cyrillic letters (additional Cyrillic letters are on **Key 06** and elsewhere)
- **X** is used for Extra symbols, mostly for letters used in African languages
- **M** is for Miscellaneous letters and symbols that don't fit into any other category

Keep in mind that Dead Key diacritic keys have extended purposes that go beyond their basic definition; those additional purposes are more extensive on some keys than others. For instance, key **6** is used both for Circumflex and for extra Cyrillic letters that did not fit on Key **W**. Each section will explain the extended features of that key.

The Dead Keys sections are organized as follows:

- Identification of the key, and what its primary and extended purposes are
- The combining and literal symbols it produces; many keys will have two of each
- The Dead Key characters produced with just **AA**, and with **AA**+**Shift**, along with their Unicode values
- The Held Key characters produced when the ***AA*** or ***AA+Shift*** is held while the final key is typed

For combining symbols, a sample is applied to a lower-case **o** to illustrate how it would look. The letter **o** itself is not part of the combining symbol, but is just present as a placeholder. The letter **o** and the combining symbol are actually combined here, just as they would be in your own documents, so you will have an idea how well they look in practice.

In the main body of each section is a list of keys on the QWERTY keyboard, with the lower-case and upper case letters produced for that key.

The following notations are used:

- **AL** means the **AA** modifier is being used for Lower-case; the Shift key is not pressed
- **AU** means the **AA** modifier is being used for Upper-case; **AU** is a shorthand for **AA+Shift**
- **AL u+** means the Unicode code point hex value for the Lower-case letter
- **AU U+** means the Unicode code point hex value for the Upper-case letter
- **AL sym** is the Lower-case letter or symbol
- **AU SYM** is the Upper-case letter or symbol

In these columns, the **red** and **blue** colors are present to help **clarify what column is what**.

> The red column used to display symbols should not be confused with the red used elsewhere for ***Held Key*** notation. These two uses of red are unrelated. (There are a limited number of colors that look attractive in documents.)

When a given final key entry appears as blank, it means that it is undefined for that key sequence. If you try to type an undefined key, it will produce Dead Key Junk.

Understanding the Dead Key guide

Keyboard key locations and Key Coordinates

The Q Keyboard identifies the letter and punctuation keys from left-to-right and top-to-bottom with two-digit hex numbers, as **key coordinates**. The left digit of a key coordinate is a **row number** from **0** to **3**, and the right digit is a **key number** starting at **0** and going up as high as **hex C** depending on the number of keys in a row.

The upper-left accent/tilde key is **key 00**, and the slash/question key is **key 39**.

> The naming convention handles the numeric row by labeling the Grave accent key as Key **00**. The digit keys 1-9 are called Keys **01** to **09**. The digit **0** key is called Key **0A** (**not** 00), with the two keys to the right being **0B** for "–" and **0C** for "=". This convention has the advantage of allowing the digit keys 1-9 to have key coordinates that are the same as the numeric value of the digit they are on.
>
> **This key coordinate system is different than the ISO standard**. ISO rows are defined by a letter **E**, **D**, **C** and **B** corresponding to the Q Keyboard rows **0**, **1**, **2** and **3**. ISO columns are defined by a 2-digit **decimal** number, while the Q Keyboard uses a single **hex** digit for this purpose.
>
> In order to relate these two systems, the Dead Key Guide for each key shows the ISO coordinate for that key, next to the Dead Key number, in ***RED ITALICS***. So, **Dead Key 00** in Q Keyboard coordinate notation is ***E00*** in ISO notation. The ISO notation is not used elsewhere in the documentation. The two systems will have comparable key column numbers on the top numeric row, but for the other rows the ISO column number will be 1 higher than the notation used by the Q Keyboard, since ISO generally starts at 1 for

data keys on the left side, while Q Keyboard notation always starts at 0.

For more information about the ISO key-naming standard, see:
https://en.wikipedia.org/wiki/ISO/IEC_9995#Physical_division_and_reference_grid

Dead Key introductory text

Every specific Dead Key guide begins with an introductory text, or **Preface**. As an example, the guide for key 39 has the following Preface:

Dead Key: 39	***B10***	***/***	**?**	**AL u+**	**AL sym**	**AU U+**	**AU SYM**
Representative Characters:				**2C65**	ⱥ	**023A**	Ⱥ
Primary Purpose:				**Slash Stroke and Oblique Stroke**			
Extended Purpose:				**Additional letters with Slash or Oblique Stroke** **Small Letter Long S With Diagonal Stroke** **Spacing and Joining symbols as Held Keys** **Thai Baht currency symbol ฿ on Held Key B** **Math symbols ≮ and ≯ and others** **Caret Insertion Point U+2041** **Reversed Question Mark**			

How to remember: Refer to / slash legend on lower-half of key cap.

The term Stroke is used ambiguously in Unicode. Dead Key 39 is intended for use with diagonal lines through the middle of letters, thus the name Slash Stroke.
For letters with horizontal lines through them, see Key 0B, Dash Stroke.

Note the combining modifiers on the / key:
- **U+0337 Combining Short Solidus Overlay**
- **U+0338 Combining Long Solidus Overlay**

These are present in few fonts, and often do not "overlay" the Solidus in the center of the base letter but tend to place it to its right, which you may find unattractive. If you plan to use these modifiers, be sure to test them for suitability.

To type the Reversed Question mark symbol on *AU / ?* hold AA+Shift and type the ? key twice.

Note: The Thai Baht currency symbol ฿ should not be used for Bitcoin. Instead, use Capital Ƀ with Dash Stroke on AC B or the official Bitcoin symbol on *AL [B.* See Currency symbols for more information.

To use lower-case-only symbols on letter keys, be sure Caps Lock is disabled.
Otherwise, you will get incorrect results.

Spacing symbols En Quad and Em Quad are on *AL . N* and *AL . M* respectively.

Do not confuse ₵ U+20A1 Colón Sign on *Held Key AL [C* with ₵ U+20B5 Cedi Sign on *Held Key AL] C* or ¢ U+00A2 Cent Sign on Live CL 2 or ȼ Ȼ with Slash Stroke on Dead AA / C

Note these special Unicode formatting characters:

- *Held AU / R* U+FFFD Replacement Character (RC)
- *Held AU / P* U+2029 Paragraph Separator (PS)
- *Held AU / L* U+2028 Line Separator (LS)

The usability of these characters may vary by application. The **Replacement Character** may or may not have a visible glyph, which is often a question mark inside a diamond. Note these characters require **Shift**.

Dead Key AL / 6 is ˄ **Caret Insertion Point**.
See **Dead Key AL 6 /** for ^ **Caret**.

Latin Letter U with Slash Stroke is expected in Unicode version 11, scheduled for June 2018. The symbols that appear in the table are approximations. If you type the key sequences shown below, the correct Unicode values will be produced, but they will not display properly unless you have an updated font that contains these new glyphs.

Latin Letter Thorn with Diagonal Stroke on letter **P** is pending approval by the Unicode Consortium. The expected code point values are show below. The symbols that appear in the table are approximations. If you type this letter, the indicted Unicode values will be produced, but they will not display properly unless you have an updated font that contains the new glyphs. Since the letter is pending approval, adoption by font vendors may take some time, and it is possible that the Unicode values could change before approval. For questions on this symbol, you should consult the Unicode Consortium at www.unicode.org.

Symbols on key **8** are **U+2E0D Right Raised Omission Bracket** and **U+2E1D Right Low Paraphrase Bracket**. Font availability is limited; the samples below are in Times New Roman. Dead Key 1C \ has corresponding left-hand symbols.

Each character guide has a heading that looks like this:

QWERTY Keys		AA Dead Key Symbols				*AA Held Key Symbols*			
LC key	UC key	AL u+	AL sym	AU U+	AU SYM	AL u+	AL sym	AU U+	AU SYM

In the guide for key 39 there is an entry for the letter **O** that looks like this:

o	O	00F8	ø	00D8	Ø	01FF	ǿ	01FE	Ǿ

This shows all of the characters that can be produced with the **O** key when you use the Slash Stroke as a **Dead Key** or as a ***Held Key***.

The preface is followed by a **Diacritic Symbols** table that shows the accents you can add when you hold the **AA** key and type the given Dead Key twice, and also specifies the available Literals. Key **39** does not have literals, so here is an example from Key **08**:

Diacritic Symbols	U+	Sym	U+	Sym

Combining Modifiers:	***Held AL 8 8***		**Dead AL 8 8**	
	030A	̊	**0325**	̥
Primary/Secondary Literals:	**Dead AL 8 Space**		**AL 8 BL 8**	
	02DA	˚	**02F3**	˳

In this example, it shows what happens if you hold **AA** and type the **8** key twice. This is known as the **Primary Combining Modifier**. When a Dead Key also has a **Secondary Combining Modifier**, you hold **AA** and press the dead key, then release **AA** and type the same dead key a **second time**.

Key 08 also well illustrates the concept of "modifier pairing". When a pair of modifiers exist where one is "above" and the other "below", and there is room on the key to define them, the "above" combining modifier is typed as a ***Held Key*** and the "below" modifier as a **Dead Key**. Literals are described below. Pairing allows related accents and symbols to be defined in a consistent way, making them easier to remember.

The combining modifier symbols are repeated in the main body of the Dead Key Guide for that letter, by showing Primary modifier as white on blue background, and the Secondary modifier as yellow on deep blue background, as seen here. Literal symbols appear only the Diacritic Symbols table.

8	*	**0325**	̥			**030A**	̊		

Most dead keys have **Literal** symbols defined. The **Primary Literal** is typed by holding **AA** and pressing the dead key, then release **AA** and press **Spacebar**. This keying method is the same as used on many other international keyboards.

If there is a **Secondary Literal**, hold **AA** and press the dead key, then release **AA**, hold **BB**, and press the same dead key again. For key **08**, this is described as **AL 8 BL 8** and is called an "**AL/BL** key sequence". This is discussed in Literal Dead Key Symbols. Use of these "**AL/BL** key sequences is unique to the Q Keyboard.

When a key contains "modifier letter" symbols that are not **combining** modifiers, these are also shown as black letters on a medium blue background. You will know these are not "combining" symbols because the lower-case **o** plus an accent will **not** be present. For example on Key **M**, the Held Key letters are "U+02B7 Modifier Letter Small W" and "U+1D42 Modifier Letter Capital W":

w	**W**	**0195**	ƕ	**01F6**	Ƕ	**02B7**	ʷ	**1D42**	ᵂ

When a key contains **Cyrillic** letters, you will see most of them as black letters on an **orange background**:

j	J	0135	ĵ	0134	Ĵ	0529	ԧ	0528	Ԧ

In a small number of cases, a **Cyrillic** letter is also a **modifier** letter. Here is an example for letter **H** appearing on the **Macron/Line Below** dead key. For these, the Unicode number will have a medium blue background, while the letter itself will have the **orange background**:

h	H	1E96	ẖ	0048	H	1D78	ᴴ		

This example also shows the letter **H** as **defective** with respect to the Line Below accent, since a precomposed letter **h** is available in lower-case, but not in upper-case. As a convenience, an unaccented capital **H** appears in the entry, shown in **yellow on gray background**. This is done in case you typed capital **H** by mistake or because Caps Lock had been on. The unaccented letter that is produced is ready to be manually accented, without having to backspace over any "Dead Key Junk" first.

Some Cyrillic letters look exactly like other Latin letters, or nearly so, and there is a risk of unintentionally typing the wrong one. (Such pairs of "cognate" letters are called "homographic glyphs".) To highlight situations like this, the Cyrillic letters have a **green background** instead of **orange**. In nearly all cases like this, Cyrillic will be on ***Held Keys*** and non-Cyrillic on **Dead Keys**. When you see the green background, it's a **reminder** to use extra care when typing these letters so that the ***AA*** key is held correctly for the letter you want.

e	E	00E8	è	00C8	È	0450	ѐ	0400	Ѐ

For **Dead Key W**, every letter is Cyrillic, so the regular blue and red display is used as shown on the left side of the line above.

Sometimes, you will see non-Cyrillic letters in black, rather than red and blue, like this:

s	S	A7A9	ꞅ	A7A8	Ꞅ	1E9C	ẜ		

or like this with a beige background:

l	L	026C	ɬ	A7AD	Ɬ	019A	ƛ	023D	Ⱡ

When you see this, it means that the letters are somehow unusual or "out of place" in some way. Here, the letter ẜ is sometimes viewed as archaic and is available in few fonts. Its appearance is also misleading, since it seems to be a stylized lower-case **F**, but is actually an old version of **S**. The example with letter L has "convenience letters" whose accents are out of place on the Diaeresis Dead Key they are defined in.

Letters with beige background are often commented on in the **Preface**.

In a few cases, some letters are special or unique that are described in the Preface, but in a way that applies only to that particular Dead Key instead of as a general rule. When that is done, the symbols involved have a different background. On key 31, here is a phonetic symbol:

=	+	01C2	ǂ						

And on key 1B, here is a Black Letter **I** in black on white, instead of red on light blue, to make it stand out:

i	I	01D0	ǐ	01CF	Ǐ	5143	元	2111	

About missing symbols in Help

In some versions of Windows, there may be a few specialty or seldom-used letters that do not display correctly in this Help document, even if you have the fonts installed that are used by Help. The reason for this problem is evidently a conflict between the version of Windows in use vs. the release level of Unicode that was supported when the given letter or symbol was first defined. Even if the symbol fails to display in **Help**, if you have font support for it, it should work correctly in other software such as text editors and word processors. If you run into these issues, and your favorite text editor or word processor has not been updated in a while, a newer version may yield better results.

Characters that were found to not display in Windows Help are mostly in the U+AB3x to U+AB6x range. Testing suggests that this issue may be resolved as of Windows 10.

As always, test your fonts and software for compatibility.

If you see a character in the Dead Key guide showing the Unicode value but only an empty square instead of the correct glyph, you can use the Character Map program provided by Windows to look up the symbol and description for that character.

There is also a third-party utility called **BabelMap** that you may find useful. It provides the same general information as Character Map does, and a wealth of additional features. Their web site is http://www.babelstone.co.uk/Software/BabelMap.html
Software is periodically updated, so be sure to check if you have the most current version.

Using the **Dead Key** for symbols in the white section

To produce ø as a Dead Key letter:

- Press and hold the **AA** modifier key (the **Alt** key remapped as **AA**)
- Type the **/** key
- Release the **AA** key; you **must** release **AA** at this point, or else the Held-Key letter will appear
- Type the **O** key
- Assuming that Caps Lock is off, the letter **ø** will appear
- If Caps Lock had been on, the letter **Ø** would have appeared instead

To produce Ø as a Late Shift Dead Key letter:

- Press and hold the **AA** modifier key
- Type the **/** key
- Release the **AA** key; you **must** release **AA** at this point
- Press and hold a **Shift** key
- Type the **O** key
- Release the Shift key
- Assuming that Caps Lock is off, the letter **Ø** will appear
- If Caps Lock had been on, the letter **ø** would have appeared instead

To produce Ø as an Early Shift Dead Key letter:

- Press and hold the **AA** modifier key and **Shift** key
- Type the **/** key
- Release the **AA** key and the Shift key; you **must** release **AA** at this point
- Type the **O** key
- The letter **Ø** will appear; Caps Lock is ignored, and may be on or off
- In step 3, if you were to release **AA** but continued to hold the Shift key until after typing the **O** key, you would get the same result

Using the ***Held Key*** for symbols in the blue section

To produce ǿ as a *Held Key* letter:

- Press and **continue to hold** the **AA** modifier key
- Type the **/** key
- Type the **O** key
- The letter **ǿ** will appear; Caps Lock is ignored, and may be on or off
- Release the **AA** key

To produce Ǿ as a *Held Key* letter:

- Press and **continue to hold** the **AA** modifier key and **Shift** key
- Type the **/** key
- Type the **O** key
- The letter **Ǿ** will appear; Caps Lock is ignored, and may be on or off
- Release the **AA** key and the **Shift** key

Key ` 00: Grave

Dead Key: 00	E00	`	~	AL u+	AL sym	AU U+	AU SYM
Representative Characters:				00E0	à	00C0	À
Primary Purpose:				Grave accent			
Extended Purpose:				Dual-accented letters with grave accent Miscellaneous math symbols Miscellaneous business symbols Business symbol ℮ "Estimated" Small Letter Rams Horn Selected Cyrillic letters			

How to remember: Refer to ` grave accent legend on lower-half of key cap.

U+0300 Combining Grave Accent and U+0340 Combining Grave Tone Mark may be very hard to distinguish. Unless you have need for a specific mark, it is recommended you use the Combining Grave Accent, since it is much more widely used than the tone mark.

Note U+1DC8 Combining Grave-Acute-Grave somewhat resembles an inverted Tilde, and may be hard to distinguish from a Combining Tilde in some fonts.

Note U+1DCA Combining Latin Small Letter R Below on *AL ` R* may be hard to distinguish from a U+031E Combining Down Tack Below in some fonts and font sizes.

Note U+2212 on AL ` – is mathematical Minus Sign, not a dash symbol.
Note U+2215 on AL ` / is mathematical Division Slash, not a slash/solidus/virgule.
Note U+2216 on AL ` \ is mathematical Set Minus, not a backslash. Set Minus is present in fewer fonts than Division Slash, and neither are well-supported.

Note U+2318 ⌘ symbol on *AL ` X* is sometimes used to represent the Windows Logo key, or the Apple Command key.

To use lower-case-only letters or special symbols on letter keys, be sure Caps Lock is disabled. Otherwise, you will get incorrect results.

Do not confuse U+212E Estimated Symbol ℮ below with U+2259 Estimates symbol ≙.

Cyrillic letters with green background can be confused with Latin. Use care when typing.

Note U+214A on *AL ` P* is Property Line symbol ⅊ used to denote survey boundaries.

U+AB5C Modifier Letter Small Heng on *AL ` H* may not appear in the Help display.

Diacritic Symbols	U+	Sym	U+	Sym
Combining Modifiers:	*Held AL ` `		Dead AL ` `	

	0300	̀	0316	̩
Primary/Secondary Literals:	Dead AL ` Space		AL ` BL `	
	02CB	`	02CE	`

QWERTY Keys		AA Dead Key Symbols				*AA Held Key Symbols*			
LC key	UC key	AL u+	AL sym	AU U+	AU SYM	AL u+	AL sym	AU U+	AU SYM
`	~	0316	̩			0300	̀		
1	!	2202	∂			222B	∫	222E	∮
2	@	221A	√			222C	∬	222F	∯
3	#	221B	∛			222D	∭	2230	∰
4	$	221C	∜			22BB	⊻		
5	%	22BC	⊼			22BD	⊽		
6	^	2227	∧			2228	∨		
7	&	2229	∩			222A	∪		
8	*	221E				221D			
9	(	212E	℮			2E28	⸨		
0	)	2205	∅			2E29	⸩		
-	_	2212	−						
=	+	2213	∓						
q	Q					1EB1	ằ	1EB0	Ằ
w	W	1E81	ẁ	1E80	Ẁ				
e	E	00E8	è	00C8	È	0450	è	0400	È
r	R	027B	ɻ			1DCA	o_r		
t	T								
y	Y	1EF3	ỳ	1EF2	Ỳ				
u	U	00F9	ù	00D9	Ù	01DC	ǜ	01DB	Ǜ
i	I	00EC	ì	00CC	Ì				
o	O	00F2	ò	00D2	Ò				
p	P					214A	⅊		
[	{	2045	⁅			27E6			
]	}	2046	⁆			27E7			

\	|	2216	\						
a	A	00E0	à	00C0	À	2100	a/c		
s	S					2101	a/s		
d	D								
f	F	2640	♀			1EC1	ề	1EC0	Ề
g	G	0264	ɤ			1EA7	ầ	1EA6	Ầ
h	H	02B1	ʱ			AB5C	ꭓ	2302	⌂
j	J								
k	K					1ED3	ồ	1ED2	Ồ
l	L	2113	ℓ			2104	₾		
;	:	0340	̀						
'	"					1DC8	ȍ		
z	Z	A641	ꝡ	A640	Ꝡ	A643	ꝣ	A642	Ꝣ
x	X	2612	☒			2318			
c	C					2106	c/u		
v	V	2611	☑			1EEB	ừ	1EEA	Ừ
b	B	2610	☐			1EDD	ờ	1EDC	Ờ
n	N	01F9	ǹ	01F8	Ǹ	045D	ѝ	040D	Ѝ
m	M	2642	♂						
,	<	27E8	⟨			27EA	⟪		
.	>	27E9	⟩			27EB	⟫		
/	?	2215	∕						

Key 01: Tillde Above and TopBar

Dead Key: 01	*E01*	1	!	AL u+	AL sym	AU U+	AU SYM
Representative Characters:				00E3	ã	00C3	Ã
Primary Purpose:				Tilde Above and TopBar			
Extended Purpose:				Dual-accented letters with Tilde Above Modifier Letter Small Gamma Fraction forms Combining Double Tilde Approximately Equal To math symbols Selected highlight/bullet symbols like ❖ TEL and FAX signs Playing-card symbols Corner marks Harpoon-style arrows			

How to remember: Tilde dead-key is a ***neighbor key*** just to the right of the accent/tilde key.

Note U+0360 Combining Double Tilde symbol on *Held AU 1 1*. For help in using combining double modifiers, see the article Introduction to combining diacritics.

Note U+218A Turned Digit Two and U+218B Turned Digit Three are intended to represent the numeric values of 10 and 11 in base-12 numbering systems. You may notice that ↊ resembles a stylized T (for Ten) and ↋ resembles a stylized E (for Eleven). These symbols are present in very few fonts; they are displayed using Roman Cyrillic Std in the table below. The ↋ symbol should not be confused with the Ɛ Open E symbol or other similar glyphs.

Note U+23E8 Decimal Exponent symbol $_{10}$ on key *Held AU 1 0* is present in few fonts.

To use lower-case-only symbols on letter keys, be sure Caps Lock is disabled.
Otherwise, you will get incorrect results.

Not all fraction forms are present in every font.

Note the < and > keys have Harpoon-style arrows, which resemble the digit 1. This should help to remember that they are located on Dead Key 1.

Diacritic Symbols	U+	Sym	U+	Sym
Combining Modifiers:	*Held AL 1 1*		Dead AL 1 1	
	0303	◌̃	0330	◌̰
Primary/Secondary Literals:	Dead AL 1 Space		AL 1 BL 1	
	02DC	˜	02F7	˷

QWERTY Keys		AA Dead Key Symbols				*AA Held Key Symbols*			
LC key	UC key	AL u+	AL sym	AU U+	AU SYM	AL u+	AL sym	AU U+	AU SYM
`	~	223C				2053			
1	!	0330	̰			0303	̃	0360	͠
2	@	218A	↊			00BD	½		
3	#	218B	↋			2153	⅓		
4	$	2756	❖			00BC	¼		
5	%	25C8				2155	⅕		
6	^	25CA	◊			2159	⅙		
7	&	25A3	▣			2150	⅐		
8	*	204E				215B	⅛		
9	(	25C9	◉			2151	⅑		
0	)	044E	ю	042E	Ю	2152	⅒	23E8	
-	_	2243	≃			2244	≄		
=	+	2245	≅			2247	≇	2246	≆
q	Q					1EB5	ẵ	1EB4	Ẵ
w	W								
e	E	1EBD	ẽ	1EBC	Ẽ	0465	ѥ	0464	Ѥ
r	R	027C	ɽ			027A	ɹ		
t	T	2121	℡						
y	Y	1EF9	ỹ	1EF8	Ỹ				
u	U	0169	ũ	0168	Ũ	1E79	ṹ	1E78	Ṹ
i	I	0129	ĩ	0128	Ĩ				
o	O	00F5	õ	00D5	Õ	022D	ȭ	022C	Ȭ
p	P								
[	{	231C				231E			
]	}	231D				231F			
\	|								
a	A	00E3	ã	00C3	Ã	A657	ꙗ	A656	Ꙗ
s	S					2660			

d	D	018C	đ	018B	Đ	2666			
f	F	213B	℻			1EC5	ễ	1EC4	Ễ
g	G	02E0	ˠ			1EAB	ẫ	1EAA	Ẫ
h	H					2665			
j	J								
k	K					1ED7	ỗ	1ED6	Ỗ
l	L								
;	:					1E4F	ṏ	1E4E	Ṏ
'	"	2032	′			1E4D	ṍ	1E4C	Ṍ
z	Z								
x	X								
c	C					2663			
v	V	1E7D	ṽ	1E7C	Ṽ	1EEF	ữ	1EEE	Ữ
b	B	0183	ƃ	0182	Ƃ	1EE1	ỡ	1EE0	Ỡ
n	N	00F1	ñ	00D1	Ñ				
m	M								
,	<	21BD		21BC		21BF		21BE	
.	>	21C0		21C1		21C2		21C3	
/	?	203B	※			215F	⅟		

Key 02: Tilde Below and Middle Tilde

Dead Key: 02	E02	2	@	AL u+	AL sym	AU U+	AU SYM
Representative Characters:				1E1B	ḕ	1E1A	Ḕ
Primary Purpose:				Tilde Below and Middle Tilde			
Extended Purpose:				Selected Math Symbols Fraction forms Latin Small Letter Reversed E Lower case ɨ with double tilde Small Black Pointing Triangles Selected Cyrillic letters Equal-like Double Hyphen on key – Two Em Dash on key M Convenience Ǧ Ȟ ǰ Ǩ with Caron Two Dot Punctuation Double Hyphen			

How to remember: Tilde Below dead-key is two keys to the right of the accent/tilde key.

To use lower-case-only symbols on letter keys, be sure Caps Lock is disabled.
Otherwise, you will get incorrect results.

The symbol on key *AL 2 E* is ɘ U+0258 Latin Small Letter Reversed E, not the letter Schwa.
For ə Ə Schwa, use Live Key BB ` (grave) or Dead Key AA X X.
The Schwa-like U+01DD Latin Small Letter Turned E as ə is on AL M E.

The symbol on key *AU 2 E* is Ǝ U+2C7B Latin Letter Small Capital Turned E.
For U+018E Latin Capital Letter Reversed E as Ǝ use AU M E.

U+AB38 Small Letter L with Double Middle Tilde on *AL 2 L* may not appear in the Help display.

Many letters with Middle Tilde are phonetic symbols or IPA Extensions.
Refer to Phonetic symbols for more information.

Not all fraction forms are present in every font.

For O-type letters that look like they have a Middle Tilde, see Cyrillic Fita on Key 06.

The letter J is *defective* with respect to the Caron accent, since a precomposed letter is available in lower-case, but not in upper-case. As a convenience, an unaccented capital J appears below, shown in yellow on gray background. If you need this accented, you must add it manually, by typing *AL]]* after the letter. You can also use Live AC J which is a digraph of J and a Caron.

U+2E3A Two-Em Dash and U+23EB Three-Em Dash are present in very few fonts. The only font found to have good implementations of these symbols was Quivira.

Note that support for letters with ˇ Caron is distributed among several keys:

Dead Key 02 • convenience keys for letters G, H, j and K with Caron

Dead Key] 1B • contains all Latin Caron letters
Live Key AA • native letters R, T, S, D, Z, C and N with Caron
Live Key AA F • E with Caron
Live Key BB] • G with Caron
Live Key BB ' • L with Caron
Live Key AC J • upper case J with Caron as a digraph (no precomposed J̌ in Unicode)

Diacritic Symbols	U+	Sym	U+	Sym
Combining Modifiers:	*Held AL 2 2*		Dead AL 2 2	
	0330	̰	0334	⃴
Primary/Secondary Literals:	Dead AL 2 Space		AL 2 BL 2	
	02F7	˷	02DC	˜

QWERTY Keys		AA Dead Key Symbols				*AA Held Key Symbols*			
LC key	UC key	AL u+	AL sym	AU U+	AU SYM	AL u+	AL sym	AU U+	AU SYM
`	~					0342	͂		
1	!					033E	̾		
2	@	0334	⃴			0330	̰		
3	#					2154	⅔		
4	$								
5	%					2156	⅖		
6	^								
7	&	214B	⅋						
8	*	2051							
9	(	2208	∈	220A		2209	∉		
0	)	220B	∋	220D		220C	∌		
-	_					02D7	ʒ		
=	+	2E40	⸀			02D6	ʑ		
q	Q								
w	W	0461	ѡ	0460	Ѡ	047F	ѿ	047E	Ѿ

e	E	1E1B	ę	1E1A	Ę	0258	ɘ	2C7B	∃
r	R	1D72	ɾ			02B5	ʵ		
t	T	1D75	ʈ						
y	Y								
u	U	1E75	ṵ	1E74	Ṵ				
i	I	1E2D	ị	1E2C	Ị				
o	O	0275	ɵ	019F	Ɵ				
p	P	1D71	ᵽ						
[	{								
]	}								
\	|								
a	A								
s	S	1D74	ˢ						
d	D	1D6D	ᵈ						
f	F	1D6E	ᶠ						
g	G	01E7	ǧ	01E6	Ǧ				
h	H	021F	ȟ	021E	Ȟ				
j	J	01F0	ǰ	004A	J				
k	K	01E9	ǩ	01E8	Ǩ				
l	L	026B	ɫ	2C62	Ɫ	AB38	ⱡ		
;	:					205A			
'	"	2033	″						
z	Z	1D76	ᶻ						
x	X								
c	C					0481	ç	0480	Ç
v	V								
b	B	1D6C	ᵇ						
n	N	1D70	ⁿ						
m	M	1D6F	ᵐ			2E3A	—		
,	<	25C2	◄			25B4	▲		
.	>	25B8	►			25BE	▼		
/	?								

Key 03: Double Acute and Double Grave

Dead Key: 03	E03	3	@	AL u+	AL sym	AU U+	AU SYM
Representative Characters:				0201	ȁ	0200	Ȁ
Primary Purpose:				Double Acute and Double Grave			
Extended Purpose:				Box Drawing Punctuation Fraction forms FF Ligatures Inverted F symbols Latin letter U+01A6 YR on key R Three Em Dash on key M Triple Prime			

How to remember: Associate the two vertical lines ‖ in # with double acute or double grave.

Note that Key 03 is used for both Double Acute and Double Grave. Double Grave letters ȍ Ȍ and ȕ Ȕ are typed as *Held Key* letters, while the remaining Double Grave letters are typed as Dead Keys. The reason for this inconsistency is to allow Hungarian typists to use regular Dead Keys for Double Acute ő Ő and ű Ű, which require less typing effort than do *Held Keys*. Letters with Double Grave accents are only rarely used, in academic works, while Double Acute letters ő Ő and ű Ű are required in everyday Hungarian.

Note that Double Acute ű Ű and ő Ő are also available as Live Keys AA H and AA K.

To remember that this key is also used for Box Drawing symbols, associate the # with the sides of an unfolded cardboard box.

Note the B-like letters on key B, which are actually variants of the letter E:

- U+025E Latin Small Letter ɞ Closed Reversed Open E
- U+029A Latin Small Letter ɚ Closed Open E

The letter ɷ that resembles these symbols but turned 90 degrees is U+0277 Latin Small Letter Closed Omega on Held Key *AL 4 W.*

Held Keys Z and Y have the same Box Drawing symbols, to allow typing of these characters with a consistent "box pattern" for both QWERTY and QWERTZ variants.
See Help when using an AZERTY variant for Box Drawing symbols.

Not all fraction forms are present in every font.

To use special symbols on letter keys, be sure Caps Lock is disabled.
Otherwise, you will get incorrect results.

U+2E4B Triple Dagger on *Held Key 3* | is expected in Unicode version 11, scheduled for June 2018. The symbol that appears in the table is an approximation. If you type the key sequence shown below, the correct Unicode value will be produced, but it will not display properly unless you have an updated font that contains this new letter. Update: As of February 2019, the most recent Roman Cyrillic Std font supports Triple Dagger.

For "lower case" equivalent of Latin Letter YR, use Small Capital R on *AL X R*

U+2E3A Two-Em Dash and U+23EB Three-Em Dash are present in very few fonts. The only font found to have good implementations of these symbols was Quivira.

Diacritic Symbols	U+	Sym	U+	Sym
Combining Modifiers:	*Held AL 3 3*		Dead AL 3 3	
	030B	ő	030F	ȍ
Primary/Secondary Literals:	Dead AL 3 Space		AL 3 BL 3	
	02F6	˶	02F5	˵

QWERTY Keys		AA Dead Key Symbols				*AA Held Key Symbols*			
LC key	UC key	AL u+	AL sym	AU U+	AU SYM	AL u+	AL sym	AU U+	AU SYM
`	~								
1	!								
2	@	25E6	◦						
3	#	030B	ő			030F	ȍ		
4	$					00BE	¾		
5	%	2031	‰			2157			
6	^	2310	⌐			221F	∟		
7	&	220E	∎			25AC			
8	*	2042	⁂			215C			
9	(	204B	⁋						
0	)	2218	∘						
-	_	2219							
=	+	203E	‾			2017	‗		
q	Q					250C	┌	2554	╔
w	W					252C	┬	2566	╦
e	E	0205	ȅ	0204	Ȅ	2510	┐	2557	╗
r	R	0211	ȑ	0210	Ȑ	01A6	Ꞧ		

t	T								
y	Y					2514	└	255A	╚
u	U	0171	ű	0170	Ű	0215	ȕ	0214	Ȕ
i	I	0209	ȉ	0208	Ȉ	FB01	fi	FB03	ffi
o	O	0151	ő	0150	Ő	020D	ȍ	020C	Ȍ
p	P	2117	℗						
[	{	2308	⌈			230A	⌊		
]	}	2309	⌉			230B	⌋		
\	|	2016	‖			2E4B	⸗		
a	A	0201	ȁ	0200	Ȁ	251C	├	2560	╠
s	S					253C	┼	256C	╬
d	D					2524	┤	2563	╣
f	F	214E	ⅎ	2132	Ⅎ	FB00	ff		
g	G	1D77	ᵹ						
h	H	0267	ɧ			2500	─	2550	═
j	J								
k	K								
l	L	2C61	ⱡ	2C60	Ⱡ	FB02	fl	FB04	ffl
;	:	205D	⁝						
'	"	2034	‴			02DD	˝		
z	Z					2514	└	255A	╚
x	X					2534	┴	2569	╩
c	C					2518	┘	255D	╝
v	V					2502	│	2551	║
b	B	025E	ɞ			029A	ɐ		
n	N								
m	M	0270	ɰ			2E3B	⸻		
,	<	2329	〈			226A	≪	22D8	⋘
.	>	232A	〉			226B	≫	22D9	⋙
/	?								

Key 04: Greek

Dead Key: 04	E04	4	$	AL u+	AL sym	AU U+	AU SYM
Representative Characters:				03B4	δ	0394	Δ
Primary Purpose:				Greek			
Extended Purpose:				Greek with Tonos; Lambda with Stroke Greek Modifier Letters Latin Delta Latin Omega Latin Turned Delta Latin Small Letter Tailless Phi Delta Equal math symbol ≜ Fraction forms Quadruple Prime Four Dot Mark Generic currency Delta-like triangular symbols			

How to remember: Digit **4** somewhat resembles a Greek **Δ** Delta; otherwise, remember with practice and use. To type separate combining symbols for Greek ´ Tonos and ¨ Dialytika, use standard Acute and Diaeresis diacritics. Unicode has no Greek-specific symbols for these.

See the article on Greek letters for more information.

Key 05 and Key 06 have additional accented Greek letters typed as *Held Keys.*
These additional letters are reproduced at the bottom of this table.

Assignment of Greek letters to Latin keys generally follows contemporary Greek keyboard usage, except that lower case **ς** final Sigma is on Held Key *AL 4 S* rather than being on **W** key.

The symbol **ƛ** U+019B Latin Small Letter Lambda with Stroke is used in a number of indigenous languages. See Apache and indigenous languages for more information. Note that this Latin letter is spelled as **Lambda** in Unicode, whereas the Greek letter **Λ λ** is spelled as **Lamda** without a **B**.

Letter on Dead Key **AA W** is **Latin Omega**, present in few fonts. See Key 02 for similar **Cyrillic Omega**. Letter on *Held Key AL 4 W* is **Latin Small Letter Closed Omega.**

Character on key **AL 4 Q** is **Theta Symbol**, rather than **Greek Letter Theta**.

Note *Held AL 4 7* is **ϗ** U+03D7 Greek Kai Symbol, used in Greek like **&** is. "Kai" means "and".

In many fonts, Small **κ** Kappa on **AL 4 K** is identical to Greenlandic letter **ĸ** Kra on **AC K.**

Not all fraction forms are present in every font.

The symbol on **AL 4 5** is U+2052 Commercial Minus Sign, not a percent sign, even though it resembles one.

Note that **Dead Key AL 4 4** produces the Generic Currency symbol **¤**. If this were typed as a *Held*

Key instead of a Dead Key, it will produce the Combining Greek Dialytika Tonos accent. The generic ¤ symbol is also on Live AC Y

Note: Greek-like math symbols µ Ω ∑ and ∏ are on Live Keys as CC M and BB M, and on Dead Key M

Additional Small/Modifier Greek letters can be found on Key 09.

Note the < and > keys have Triangle-style arrows, which resemble a Greek Δ Delta. This should help to remember that they are located on Dead Key 4, which is the Greek Dead Key.

Diacritic Symbols	U+	Sym	U+	Sym
Combining Modifiers:	*Held AL 4 4*		Dead AL 4 4	
	0344	ö		
Primary/Secondary Literals:	Dead AL 4 Space		AL 4 BL 4	
	0385	̅		

QWERTY Keys		AA Dead Key Symbols				*AA Held Key Symbols*			
LC key	UC key	AL u+	AL sym	AU U+	AU SYM	AL u+	AL sym	AU U+	AU SYM
`	~								
1	!								
2	@								
3	#	03F6	϶			03F5	ϵ		
4	$	00A4	¤			0344	ö		
5	%	2052	⁅			2158	⅘		
6	^								
7	&	03D2	ϒ			03D7	ϗ		
8	*	2C77	ⲱ						
9	(	018D	ƍ						
0	)	03D5	ϕ			1D60	ᵠ		
-	_								
=	+	225C							

q	Q	03D1	ϑ	03F4	ϴ				
w	W	A7B7	ꞷ	A7B6	Ꞷ	0277	ɷ		
e	E	03B5	ε	0395	Ε	03AD	έ	0388	Έ
r	R	03C1	ρ	03A1	Ρ	03F1	ϱ		
t	T	03C4	τ	03A4	Τ	03FC	ϱ		
y	Y	03C5	υ	03A5	Υ	03CD	ύ	038E	Ύ
u	U	03B8	θ	0398	Θ	1DBF	ᶿ		
i	I	03B9	ι	0399	Ι	03AF	ί	038A	Ί
o	O	03BF	ο	039F	Ο	03CC	ό	038C	Ό
p	P	03C0	π	03A0	Π	03D6	ϖ		
[	{								
]	}								
\	|								
a	A	03B1	α	0391	Α	03AC	ά	0386	Ά
s	S	03C3	σ	03A3	Σ	03C2	ς		
d	D	03B4	δ	0394	Δ	1E9F	ẟ		
f	F	03C6	ϕ	03A6	Φ	1DB2	ᶲ		
g	G	03B3	γ	0393	Γ	1D5E	ᵞ		
h	H	03B7	η	0397	Η	03AE	ή	0389	Ή
j	J	03BE	ξ	039E	Ξ				
k	K	03BA	κ	039A	Κ	03F0	ϰ		
l	L	03BB	λ	039B	Λ	019B	ƛ		
;	:	205E	⁞			205B	⁛		
'	"	2057	⁗						
z	Z	03B6	ζ	0396	Ζ				
x	X	03C7	χ	03A7	Χ	1D61	ᵡ		
c	C	03C8	ψ	03A8	Ψ				
v	V	03C9	ω	03A9	Ω	03CE	ώ	038F	Ώ
b	B	03B2	β	0392	Β	03D0	ϐ		
n	N	03BD	ν	039D	Ν				
m	M	03BC	μ	039C	Μ				
,	<	22B2	⊲			2206	∆		

.	>	22B3	⊳			2207	∇		
/	?								
Greek Letters on Held Key *AA 5*									
y	Y					03CB	ϋ	03AB	Ÿ
i	I	012F	ĵ	012E	Ĵ	03CA	ϊ	03AA	Ï
Greek Letters on Held Key *AA 6*									
y	Y	0177	ŷ	0176	Ŷ	03B0	ϋ		
i	I	00EE	î	00CE	Î	0390	ϊ		

Key 05: Ogonek and Descender

Dead Key: 05	*E05*	5	%	AL u+	AL sym	AU U+	AU SYM
Representative Characters:				0105	ą	0104	Ą
Primary Purpose:				Ogonek and Descender			
Extended Purpose:				Greek ϊ ϋ with Dialytika Letter O with Ogonek+Macron Letters S and Z with Swash Tail Small Letter U with Left Hook Fraction forms Selected Cyrillic letters Convenience ǥ Ǥ with Dash Stroke Square and Circle Figures Black and white square and circle symbols Degree marks °C and °F			

How to remember: % is like two o letters with / between; compare to word Ogonek.
It may help to imagine the word Ogonek being spelled as %nek.

See Key 04 and Key 06 for additional accented Greek letters typed as *Held Keys*.

Note U+1DCE Combining Ogonek Above is present in few fonts. One where it is present is called Cardo.

All Cyrillic letters on Key 05 are in the Unicode range U+05xx.

Notice how the Cyrillic letters on key R appear as if stylized forms of the letter R in which the left vertical line has been removed; they are known as ҂ Ҁ Komi Zje and ҅ ҄ Komi Dzje.

To use lower-case-only symbols on letter keys, be sure Caps Lock is disabled.
Otherwise, you will get incorrect results.

Cyrillic letters with green background can be confused with Latin. Use care when typing.

U+AB52 Small Letter U with Left Hook on *AL 5 U* may not appear in the Help display.
This letter is present in few fonts.

Not all fraction forms are present in every font.

Diacritic Symbols	U+	Sym	U+	Sym
Combining Modifiers:	*Held AL 5 5*		Dead AL 5 5	
	0328	ǫ	1DCE	ᳰ
Primary/Secondary Literals:	Dead AL 5 Space		AL 5 BL 5	

	02DB	˛		

QWERTY Keys		AA Dead Key Symbols				*AA Held Key Symbols*			
LC key	UC key	AL u+	AL sym	AU U+	AU SYM	AL u+	AL sym	AU U+	AU SYM
`	~								
1	!								
2	@								
3	#								
4	$								
5	%	1DCE	ȣ			0328	ǫ		
6	^					215A	⅚		
7	&								
8	*					215D	⅝		
9	(	26AA	∘			26AB	•		
0	)	25CB	○			25CF	●		
-	_								
=	+	25A1	□			25A0	■		
q	Q					051B	q	051A	Q
w	W					051D	w	051C	W
e	E	0119	ę	0118	Ę	2203	∃	2204	∄
r	R	0505	ȓ	0504	Ȓ	0507	ȝ	0506	Ȝ
t	T	A729	ʈʒ	A728	Ʈʒ	050F	ȚȚ	050E	ȚȚ
y	Y					03CB	ÿ	03AB	Ÿ
u	U	0173	ų	0172	Ų	AB52	ꞟ		
i	I	012F	ȉ	012E	Ȉ	03CA	ï	03AA	Ï
o	O	01EB	ǫ	01EA	Ǫ	01ED	ǭ	01EC	Ǭ
p	P								
[	{	25AB	▫			25AA	▪		
]	}	25FD	▫			25FE	▪		
\	|	25FB	▫			25FC	▪		

a	A	0105	ą	0104	Ą	2200	∀		
s	S	0285	ȴ			023F	ȿ	2C7E	Ȿ
d	D	0501	ԁ	0500	Ԁ	0503	ԃ	0502	Ԃ
f	F					2109	℉		
g	G	01E5	ǧ	01E4	Ǧ	050D	ԍ	050C	Ԍ
h	H	2C68	ⱨ	2C67	Ⱨ	050B	ԋ	050A	Ԋ
j	J								
k	K	2C6A	ⱪ	2C69	Ⱪ	051F	ԟ	051E	Ԟ
l	L					0509	ԉ	0508	Ԉ
;	:								
'	"								
z	Z	2C6C	ⱬ	2C6B	Ⱬ	0240	ⱥ	2C7F	Ⱥ
x	X								
c	C					2103	℃		
v	V								
b	B								
n	N	A791	ꞑ	A790	Ꞑ				
m	M								
,	<								
.	>								
/	?								

Key 06: Circumflex and Cyrillic

Dead Key: 06	E06	6	^	AL u+	AL sym	AU U+	AU SYM
Representative Characters:				00E2	â	00C2	Â
Primary Purpose:				Circumflex Above and extra Cyrillic letters			
Extended Purpose:				Greek ϊ ϋ with Dialytika and Tonos Math symbol ≙ "Estimates" Selected "raised" punctuation symbols			

How to remember: Refer to ^ circumflex legend on upper-half of key cap.
"Circumflex" and "Cyrillic" have similar-sounding first syllables.

Circumflex Dead Key 6 provides the main support for letters used in the language Esperanto.
The other letter it uses, ŭ Ŭ with Breve, is on Live Key AA P and on Dead Key AA 0 U.

Note U+1DCD Combining Double Circumflex Above symbol on *Held AU 6 6*. For help in using combining double modifiers, see the article Introduction to combining diacritics.

Note Modifier Letter Raised Colon, Raised Comma and Raised Dot on colon, comma and period keys. To remember, think of the upward pointing ^ symbol on key 6 as "raised".

The majority of Cyrillic letters are on Dead Key W.
See Help for a complete list of of all Cyrillic letters not on Dead Key W.

The letter ѳ Ѳ on *AA 0* is Cyrillic Fita , which resembles a Cyrillic Barred O.
Fita is considered archaic with respect to modern Cyrillic-based languages.
See also Live keys AB 0 / BC 0 for similar ɵ and Ɵ which are Cyrillic-like Latin letters.

See AA 8 B on Key 08 for ъ Ъ Semisoft sign, very similar to AA 6 B below in some fonts.
To help remember, note that AA 6 B has Unicode values of U+046x.

Combining Circumflex Below diacritic is located on Key 1A, the [key.

Dead Key AL 6 / is ˆ Caret.
See Dead Key AL / 6 for ⁄ Caret Insertion Point.

Cyrillic letters with green background can be confused with Latin. Use care when typing.

The letter я on AL R resembles Cyrillic, but is U+1D19 Latin Letter Small Capital Reversed R.

Note that U+1D19 Latin Letter Small Capital Reversed R and U+1D1A Latin Letter Small Capital Turned R are rendered with incorrect glyphs in Calibri Bold font.

Do not confuse U+212E Estimated Symbol ℮ on Dead AL ` 9 with U+2259 Estimates symbol ≙ appearing below.

Note how Cyrillic letters on AA 6 1 like ы somewhat resemble the digits 61 run together.
This will help in remembering these letters.

Note how letter ɑ Ɑ U+01A3 Latin Small Letter GHA on key 9 (which is misnamed in Unicode as

Latin Small Letter OI) looks somewhat like a stylized digit 9 or as a digit 9 turned on its side.

U+2201 on *Held AL 6 C* is Complement math symbol ∁, not Latin Letter C.
U+0297 on *Held AL 9 C* is ʇ phonetic symbol Stretched C, not Latin Letter C.

See Key 04 and Key 05 for additional accented Greek letters typed as *Held Keys.*

Diacritic Symbols	U+	Sym	U+	Sym
Combining Modifiers:	*Held AL 6 6*		Dead AL 6 6	
	0302	ô	032D	o̭
Primary/Secondary Literals:	Dead AL 6 Space		AL 6 BL 6	
	02C6	ˆ	A788	ꞈ

QWERTY Keys		AA Dead-Key Symbols				*AA Held Key Symbols*			
LC key	UC key	AL u+	AL sym	AU U+	AU SYM	AL u+	AL sym	AU U+	AU SYM
`	~								
1	!	044B	ы	042B	Ы	04F9	ӹ	04F8	Ӹ
2	@	0454	є	0404	Є	0511	ԑ	0510	Ԑ
3	#					04E1	ӡ	04E0	Ӡ
4	$	04CC	ҍ	04CB	Ҍ	04F5	ӵ	04F4	Ӵ
5	%					0495	ҕ	0494	Ҕ
6	^	032D	o̭			0302	ô	1DCD	᷍o
7	&					0491	ґ	0490	Ґ
8	*	0359	o͙			20F0	⃰o		
9	(	01A3	ƣ	01A2	Ƣ				
0	)					0473	ѳ	0472	Ѳ
-	_	0349	o͉			031A	̚o		
=	+	2259	≙						
q	Q					04D5	æ	04D4	Æ
w	W	0175	ŵ	0174	Ŵ				
e	E	00EA	ê	00CA	Ê	04D7	ĕ	04D6	Ĕ

r	R	1D19	я			02B4	ʴ		
t	T								
y	Y	0177	ŷ	0176	Ŷ	03B0	ΰ		
u	U	00FB	û	00DB	Û	A661	ꙋ	A660	Ꙋ
i	I	00EE	î	00CE	Î	0390	ΐ		
o	O	00F4	ô	00D4	Ô	047B	ѻ	047A	Ѻ
p	P					0517	ԗ	0516	Ԗ
[	{								
]	}	2423	␣			02FD	‿		
\	|								
a	A	00E2	â	00C2	Â	04D1	ӑ	04D0	Ӑ
s	S	015D	ŝ	015C	Ŝ				
d	D								
f	F								
g	G	011D	ĝ	011C	Ĝ				
h	H	0125	ĥ	0124	Ĥ	04BB	ҥ	04BA	Ҥ
j	J	0135	ĵ	0134	Ĵ	0529	ԩ	0528	Ԩ
k	K	049F	ҟ	049E	Ҟ	049D	ҝ	049C	Ҝ
l	L	0513	ԓ	0512	Ԓ	04C6	ӆ	04C5	Ӆ
;	:	02F8	˸						
'	"								
z	Z	1E91	ẑ	1E90	Ẑ				
x	X								
c	C	0109	ĉ	0108	Ĉ	2201	∁		
v	V	0475	ѵ	0474	Ѵ	0477	ѷ	0476	Ѷ
b	B	0463	ѣ	0462	Ѣ	A64F	ꙟ	A64E	Ꙟ
n	N								
m	M								
,	<	2E34	‚			A71B	↑		
.	>	2E33	.			A71C	↓		
/	?	2038							

Key 07: Hook

Dead Key: 07	E07	7	&	AL u+	AL sym	AU U+	AU SYM
Representative Characters:				1EA3	ả	1EA2	Ả
Primary Purpose:				Hook Above (Vietnamese)			
Extended Purpose:				Dual-accent Vietnamese with Hook Held Key letters with Retroflex Hooks Letters with Flourish and Squirrel Tail Selected Cyrillic letters Fraction forms Modifier Begin/End Tone mark Tironian Et sign ⁊ on 7 Convenience G with Acute accent Black and white diamond symbols			

How to remember: Digit **7** shape somewhat resembles a large Hook-Above diacritic.

Literal symbol is **U+02C0 Modifier Letter Glottal Stop**, an approximation of a Hook Above.

Dead Key 07 is primarily for the **Vietnamese Hook Above** and for letters with **Retroflex** (right-curving) **Hooks**. Dead Key X is for **Hook** letters like **Ƀ** that are often used in African languages.

To use lower-case-only symbols on letter keys, be sure Caps Lock is disabled.
Otherwise, you will get incorrect results.

Note these symbols on key **3**:
- **U+1D9A Latin Small Letter Ezh With Retroflex Hook**
- **U+1D94 Latin Small Letter Reversed Open E With Retroflex Hook**

These letters may be difficult to distinguish in some fonts.
Usually, the letter **ʒ Ezh** has a flat top, while the **ᶚ Reversed Open E** has a rounded top.

U+02A0 ɋ Latin Small Letter Q with Hook is on **Dead Key AL 7 Q** below.
U+024B ɋ Latin Small Letter Q with Hook Tail is on **Dead Key AL X Q**

For Comma Above combining symbol, use ***Held Key AL , 9***
For **’** Comma Above literal, use **Live Key CC]** or **Live Key BB , (comma)**

Latin Letter ƀ Ƀ with Flourish was used in Middle Vietnamese during the 17th century.
Letters with **Flourish** and **Squirrel Tail** are archaic and present in very few fonts.

Key , 37 normally used for **Cedilla** letters can also be used for **ư Ư** and **ơ Ơ** with **Horn**.

U+AB34 Small Letter E with Flourish on **AL 7 F** may not appear in the Help display.

To type **Tironian Et** sign **⁊** hold **AA** and press **7**, then release **AA** and type **7** a second time.
This is an archaic letter sometimes used in Ireland and Scotland to mean **"and"**.

Note how Cyrillic letter **ҭl** on **AA 7 1** somewhat resemble the digits **71** run together.
Note how Cyrillic letter **ҭ** on **AA 7 6** somewhat resemble the digits **76** run together.

These are convenience letters, available here to help make Cyrillic easier to type.

Font availability may be limited for some kinds of diamond symbols. Segoe UI Symbol font was used for the diamonds below.

Not all fraction forms are present in every font.

Diacritic Symbols	U+	Sym	U+	Sym
Combining Modifiers:	*Held AL 7 7*		Dead AL 7 7	
	0309	◌̉		
Primary/Secondary Literals:	Dead AL 7 Space		AL 7 BL 7	
	02C0	ˀ		

QWERTY Keys		AA Dead Key Symbols				*AA Held Key Symbols*			
LC key	UC key	AL u+	AL sym	AU U+	AU SYM	AL u+	AL sym	AU U+	AU SYM
`	~					1D95	ᶙ		
1	!					A651	ꙑ	A650	Ꙑ
2	@								

3	#	1D9A	ʒ			1D94	ʒ		
4	$	02AE	ɥ			02AF	ɥ		
5	%								
6	^	044C	ь	042C	Ь	044A	ъ	042A	Ъ
7	&	204A				0309	̉		
8	*	22C6				215E	⅞		
9	(	2B26	◇			2B25	◆		
0	)	25C7	◇			25C6	◆		
-	_	22C4	◇			2B29	◆		
=	+								
q	Q	02A0	ɋ			1EB3	ẳ	1EB2	Ẳ
w	W								
e	E	1EBB	ẻ	1EBA	Ẻ	1D92	ɛ		
r	R	027E	ɾ			027F	ɿ		
t	T					0288	ʈ	01AE	Ʈ
y	Y	1EF7	ỷ	1EF6	Ỷ				
u	U	1EE7	ủ	1EE6	Ủ	1D99	ʊ		
i	I	1EC9	ỉ	1EC8	Ỉ	1D96	ɨ		
o	O	1ECF	ỏ	1ECE	Ỏ	1D97	ɔ		
p	P	A753	ꝑ	A752	Ꝑ	A755	ᵽ	A754	Ᵽ
[	{	02F9	˹			02FB	˻		
]	}	02FA	˺			02FC	˼		
\	|								
a	A	1EA3	ả	1EA2	Ả	1D8F	ɐ		
s	S	1D98	ʃ			0282	ʂ		
d	D					1D91	ɖ		
f	F	AB34	ɘ			1EC3	ể	1EC2	Ể
g	G	01F5	ǵ	01F4	Ǵ	1EA9	ẩ	1EA8	Ẩ
h	H	0527	ԧ	0526	Ԧ	04A5	ҥ	04A4	Ҥ
j	J								
k	K					1ED5	ổ	1ED4	Ổ

l	L	A78E	ɬ			026D	ɭ		
;	:								
'	"								
z	Z	0225	ʐ	0224	Ʒ	0290	ʑ		
x	X								
c	C								
v	V	2C71	ⱴ			1EED	ử	1EEC	Ử
b	B	A797	ꞗ	A796	Ꞗ	1EDF	ở	1EDE	Ở
n	N					0273	ɲ	1DAF	ᵰ
m	M								
,	<								
.	>								
/	?								

Key 08: Ring and Archaic

Dead Key: 08	E08	8	*	AL u+	AL sym	AU U+	AU SYM
Representative Characters:				00E5	å	00C5	Å
Primary Purpose:				Ring Above and Ring Below			
Extended Purpose:				Archaic and seldom-used letters Half-Ring diacritic symbols and modifier letters IPA digraphs and letters with curl and crossed tail Insular letters R, T, S, D, F, G and Turned G Yogh, Wynn Cyrillic Semisoft sign ҍ ҍ Combining arrows, useful for vector notation			

How to remember: * has round-like shape, comparable to ° ring diacritic.

Note Latin Letter ǻ Ǻ With Ring Above And Acute is on Live Key BB W only.
There is no Dead Key or *Held Key* sequence for this letter.

Half-Ring Combining uses (and) after key 8. Parentheses reflect symbol shapes.
Half-Ring Literals use [and] after key 8 instead of Spacebar.

The letters W and Y are *defective* with respect to the Ring Above accent, since precomposed letters are available in lower-case, but not in upper-case. However, unlike other similar letters on the Q Keyboard, no unaccented convenience capitals are provided for W and Y. That is because ẘ and ẙ are rarely used (reportedly only to transcribe certain Arabic letters) and are not present in any native alphabets.

Letters with curls on *AL Held Keys* are mostly on their native key locations. Other digraphs and ligatures on AL Dead Keys and *AL Held Keys* were placed wherever space was available, and not all have easily remembered associations. These must be learned with practice and use, or looked up as needed.

On key E and key 4 are Tresillo and Cuatrillo, Latin letters used in certain colonial Mayan alphabets. Do not confuse Latin Letter Tresillo with Latin Letter Open E. See Wikipedia articles here and here for more information.

Note Dead Key AA 8 3 is Letter Yogh, while *Held Key AA 8 3* is Latin Letter Et.
- Latin Letter Et is unrelated to Tironian Et sign on Key 07.
- Scots letter Yogh ȝ is not always rendered well in fonts. See Help for more information.

Note Held key *AA W* which looks like W with a 'hook' is actually Latin Letter VY.

Some symbols like Insular S do not resemble the Latin letters they are named for.
See article on Archaic and lesser-used letters for more information.

Note U+1DD8 Combining Latin Small Letter Insular D is present in very few fonts.

To use lower-case-only symbols on letter keys, be sure Caps Lock is disabled.
Otherwise, you will get incorrect results.

See Arrows for information about using Combining Arrow and Combining Harpoon modifiers. These symbols can be used to denote math Vectors, if your font supports this.

See AA 6 B on Key 06 for ѣ Ѣ Cyrillic letter Yat, very similar to AA 8 B below in some fonts. To help remember, note that AA 8 B has Unicode values of U+048x.

The following symbols may not appear in the Help display:

U+AB49 Small Letter R with Crossed Tail on *AL 8 R*
U+AB36 Small Letter Script G with Crossed Tail on *AL 8 H*
U+AB39 Small Letter L with Middle Ring on *AL 8 L*
U+AB3B Small Letter N with Crossed Tail on *AL 8 N*
U+AB3A Small Letter M with Crossed Tail on *AL 8 M*

Diacritic Symbols	U+	Sym	U+	Sym
Combining Modifiers:	*Held AL 8 8*		Dead AL 8 8	
	030A	◌̊	0325	◌̥
Primary/Secondary Literals:	Dead AL 8 Space		AL 8 BL 8	
	02DA	˚	02F3	˳

QWERTY Keys		AA Dead Key Symbols				*AA Held Key Symbols*			
LC key	UC key	AL u+	AL sym	AU U+	AU SYM	AL u+	AL sym	AU U+	AU SYM
`	~	025A	ⱥ			025D	ⱦ		
1	!								
2	@	A75B	ꝛ	A75A	Ꝛ				
3	#	021D	ȝ	021C	Ȝ	A76B	ꝝ	A76A	Ꝝ
4	$	A72D	ꞅ	A72C	Ꞅ	A72F	ꞇ	A72E	Ꞇ
5	%								
6	^	1EFD	Ꝋ	1EFC	Ꝋ				
7	&					033B	◌̪		
8	*	0325	◌̥			030A	◌̊		
9	(	A76F	ꝯ	A76E	Ꝯ	0351	◌ͤ	031C	◌̜
0	)	A74F	ꝏ	A74E	Ꝏ	0357	◌̗	0339	◌̩
-	_					0320	◌̠		

=	+					031F	̟		
q	Q								
w	W	1E98	ẘ			A761	ʷ	A760	ʷ
e	E	A72B	ɛ	A72A	Ɛ	0293	ʒ		
r	R	A783	ɾ	A782	ɾ	AB49	ɹ		
t	T	A787	ʈ	A786	Ʈ	0236	ȶ		
y	Y	1E99	ẙ			02A7	ʧ		
u	U	016F	ů	016E	Ů	1D6B	ʉ		
i	I	A76D	ʃ	A76C	Ʃ				
o	O	A74D	ɔ	A74C	Ɔ	2C7A	ɷ		
p	P	01BF	ƿ	01F7	Ƿ	0239	ɸ		
[	{	02BF	˿			02D3	˓		
]	}	02BE	˾			02D2	˒		
\	|								
a	A	00E5	å	00C5	Å	1E01	ᵃ	1E00	ᵃ
s	S	A785	ʂ	A784	Ʂ	0286	ʃ	FB06	ˢᵗ
d	D	A77A	ɖ	A779	Ɖ	0221	ȡ	1DD8	ᵈᵒ
f	F	A77C	ꞙ	A77B	Ꞙ	02A9	fŋ	FB05	ˢᵗ
g	G	1D79	ɡ	A77D	Ɡ	A77F	ɢ	A77E	ɢ
h	H	2C76	ⱶ	2C75	Ⱶ	AB36	ɡ		
j	J	02A4	ʤ			026E	ɮ		
k	K	02A6	ʦ			02AA	ɬs		
l	L	1EFB	ỉ	1EFA	Ỉ	AB39	ɫ		
;	:	A747	ꞎ	A746	ꞎ	0234	ɳ		
'	"								
z	Z	02A5	ʤ			0291	ʒ		
x	X	02A3	ʣ			02AB	ɮz		
c	C	02A8	ʨ			0255	ɕ		

v	V	A769	ɣ	A768	Ɣ	2C74	ⱱ		
b	B	048D	ƀ	048C	Ƀ	0238	ȣ		
n	N	0235	ȵ			AB3B	ꞡ		
m	M					AB3A	ꞡ		
,	<	20D0	⃐			20D6	⃖		
.	>	20D1	⃑			20D7	⃗		
/	?	034E	͎			20E1	⃡		

Key 09: Inverted Breve

Dead Key: 09	E09	9	(	AL u+	AL sym	AU U+	AU SYM
Representative Characters:				0203	â	0202	Â
Primary Purpose:				Inverted Breve			
Extended Purpose:				Glottal Stop and other phonetic symbols Latin Stretched C Subscript and superscript letters Math symbol ≙ "Corresponds To" Combining Double Inverted Breve			

How to remember: Inverted Breve looks like (turned 90 degrees clockwise.
Glottal Stop symbols like ʔ bear a resemblance to shape of digit 9.

Note U+0361 Combining Double Inverted Breve symbol on *Held AU 9 9*. For help in using combining double modifiers, see the article Introduction to combining diacritics.

U+2201 on *Held AL 6 C* is Complement math symbol ∁, not Latin Letter C.
U+0297 on *Held AL 9 C* is ʗ phonetic symbol Stretched C, not Latin Letter C.

Stretched C was considered a "postalveolar" or "palatal" click in IPA.
That purpose is now served by the click symbols ǃ and ǂ which can be found on Dead Key X.
Stretched C is present here for backward compatibility with the older IPA standard.

Note the Inverted Glottal Stop symbols on key 5 resemble digit 5 with the top bar removed.
These symbols are not frequently used.

In some cases, the Inverted Breve Literal Symbol ˆ may be used as an alternative Glottal Stop indication in certain Polynesian languages.

Note U+02C1 Modifier Letter Reversed Glottal Stop and U+02E4 Modifier Letter *Small* Reversed Glottal Stop may be difficult to distinguish in many fonts.

Additional Small/Modifier Greek letters can be found on Key 04.

U+207F ⁿ Superscript Latin Small Letter N can be found on *AL M N* where it is treated as a modifier letter, since there is no discrete Modifier Letter Small N defined in Unicode.

When working with Breve and Inverted Breve accents, it may be hard to remember which of these is the *inverted* one. Here is a 'trick' to help remember:

For Breve, associate the V in the word BREVE with the shape of the ˘ Breve accent.

For Inverted Breve, imagine the word BREVE turned upside-down, like BƆEΛE. Then, associate the inverted-V letter Λ with the shape of the ˆ Inverted Breve accent.

Diacritic Symbols	U+	Sym	U+	Sym
Combining Modifiers:	*Held AL 9 9*		Dead AL 9 9	
	0311	ô	032F	o̯
Primary/Secondary Literals:	Dead AL 9 Space		AL 9 BL 9	
	1D54	ˆ		

QWERTY Keys		AA Dead Key Symbols				*AA Held Key Symbols*			
LC key	UC key	AL u+	AL sym	AU U+	AU SYM	AL u+	AL sym	AU U+	AU SYM
`	~					2094	ₐ		
1	!								
2	@								
3	#								
4	$								
5	%	0296	ʖ			01BE	ƾ		
6	^								
7	&								
8	*	2217	∗						
9	(	032F	o̯			0311	ô	0361	o͡
0	)	0298	ʘ			032B	o̪		
-	_								
=	+	2258	≘						
q	Q								
w	W					02AC	ʷʷ		
e	E	0207	ê	0206	Ê	2091	ₑ		
r	R	0213	r̂	0212	R̂	1D63	ᵣ		
t	T					209C	ₜ		
y	Y					1DB7	ᵝ		
u	U	0217	û	0216	Û	1D64	ᵤ		
i	I	020B	î	020A	Î	1D62	ᵢ	2071	ⁱ
o	O	020F	ô	020E	Ô	2092	ₒ		

p	P	1D68	ᵽ			209A	ₚ		
[	{	02C1	ˁ			02AD	ʭ		
]	}	02C0	ˀ						
\	|	02E4	ˠ						
a	A	0203	â	0202	Â	2090	ₐ		
s	S					209B	ₛ	1DB3	ˢ
d	D					1D5F	ᵭ	1D9E	ᶞ
f	F					1D69	ᵩ		
g	G					1D67	ᵧ	1DA2	ᶢ
h	H					2095	ₕ		
j	J					2C7C	ⱼ		
k	K					2096	ₖ		
l	L					2097	ₗ		
;	:								
'	"								
z	Z								
x	X	1D6A	χ			2093	ₓ		
c	C					0297	ᶜ		
v	V					1D65	ᵥ		
b	B	1D5D	β			1D66	ᵦ		
n	N					2099	ₙ	1D51	ᵑ
m	M					2098	ₘ		
,	<	0295	ʕ			02A2	ʢ		
.	>	0294	ʔ			02A1	ʡ		
/	?	0242	ɒ			0241	ʁ		

Key 0 0A: Breve

Dead Key: 0A	E10	0	)	AL u+	AL sym	AU U+	AU SYM
Representative Characters:				0115	ĕ	0114	Ĕ
Primary Purpose:				Breve Above and H with Breve Below			
Extended Purpose:				Letter ȧ with Right Half Ring Combining Small Letters Combining Double Breve symbols Held letters with Palatal and Retroflex Hooks Latin ligatures uo and ie Dotted Circle symbol Selected Turned Letters Cyrillic ў Ў Fraction forms Circled math operators			

How to remember: Breve ˘ looks like) turned 90 degrees clockwise.

Literal on AL 0 Space is U+02D8 Breve Spacing Modifier Letter.
Literal on AL 0 BL 0 is U+1D55 Modifier Letter Small Bottom Half O.
The Bottom Half O is similar to, but usually sits lower than, the Breve Modifier Letter.

Note U+035D Combining Double Breve symbol on *Held AU 0 0*, and
U+035C Combining Double Breve Below symbol on Dead AU 0 0.
For help in using combining double modifiers, see the article Introduction to combining diacritics.

Note U+1DCB Combining Breve-Macron symbol on = key. This symbol is present in few fonts.

Depending on the font used and available line spacing, the Combining Double Breve Below is susceptible to being truncated. If the symbol does not appear, or is rendered incorrectly, try changing the font or increasing the available inter-line spacing, if possible.

For help in using combining double modifiers, see article Combining Diacritics Complete List.

To use lower-case-only symbols on letter keys, be sure Caps Lock is disabled.
Otherwise, you will get incorrect results.

Note that U+1D19 Latin Letter Small Capital Reversed R and U+1D1A Latin Letter Small Capital Turned R are rendered with incorrect glyphs in Calibri Bold font.

Letters c and h with Palatal Hook are present in few fonts.

For Ḕ with Breve and Cedilla, type E with Cedilla as a *Held Key*. See Key 37.

Symbols ꝏ (uo) U+AB63 and ꝛꝛ (ꝛe) U+AB61 are Latin ligatures that can be used in Romanized Chechen. These ligatures are present in very few fonts, and may be undisplayable in the Q Keyboard CHM Help, because they were only incorporated into the Unicode standard as of version 8.0. If you are viewing this Help on a system that does not support version 8.0 or greater of the Unicode standard (such as Windows 7), these symbols will appear as empty

squares, even if other applications you use (like word processors) do support them. This is not an error, but is simply a Windows limitation. For considerations when using these symbols, or substitutes for them, see Alphabets with Cyrillic letters.

The Dotted Circle ◌ on *AL 0 O* can be used as a "base letter" to illustrate a combining diacritic, instead of using letter o for that purpose. This documentation generally uses letter o instead of the dotted circle.

Not all fraction forms are present in every font.

Note the Cyrillic letter ў Ў on the Y key. There is no precomposed *Latin* letter Y with Breve, so the usual green background is not used here. Still, this letter is similar enough to a Latin Y that care is needed not to confuse it with Latin.

Circumflex Dead Key 6 provides the main support for letters used in the language Esperanto. The other letter it uses, ŭ Ŭ with Breve, is on Live Key AA P and on Dead Key AA 0 U.

When working with Breve and Inverted Breve accents, it may be hard to remember which of these is the *inverted* one. Here is a 'trick' to help remember:

For Breve, associate the V in the word BREVE with the shape of the ˘ Breve accent.

For Inverted Breve, imagine the word BREVE turned upside-down, like BƆEΛE. Then, associate the inverted-V letter Λ with the shape of the ˆ Inverted Breve accent..

Diacritic Symbols	U+	Sym	U+	Sym
Combining Modifiers:	*Held AL 0 0*		Dead AL 0 0	
	0306	ŏ	032E	o̮
Primary/Secondary Literals:	Dead AL 0 Space		AL 0 BL 0	
	02D8	˘	1D55	ᵕ

QWERTY Keys		AA Dead Key Symbols				*AA Held Key Symbols*			
LC key	UC key	AL u+	AL sym	AU U+	AU SYM	AL u+	AL sym	AU U+	AU SYM
`	~								
1	!	A655	ꙮ	A654	ꙮ				
2	@								
3	#					2189			

4	$								
5	%								
6	^								
7	&								
8	*					2297		229B	
9	(					033C	o̽		
0	)	032E	o̭	035C	o͡	0306	ŏ	035D	o͜
-	_					2296		229D	
=	+	1DCB	o᷎			2295		229C	
q	Q	1E9A	ȧ						
w	W	028D	ʍ						
e	E	0115	ĕ	0114	Ĕ	1D93	ɛ᷉	0364	o^{e}
r	R	0279	ɹ	1D1A	ʁ	1D89	ɾ᷉	036C	o^{r}
t	T	0287	ʇ	A7B1	Ʇ	01AB	ʈ᷉	036D	o^{t}
y	Y	028E	ʎ			045E	ў	040E	Ў
u	U	016D	ŭ	016C	Ŭ	AB63	ɯ	0367	o^{u}
i	I	012D	ĭ	012C	Ĭ	AB61	ɪ᷉	0365	o^{i}
o	O	014F	ŏ	014E	Ŏ	25CC	◌	0366	o^{o}
p	P					1D88	p᷉		
[	{	0319	o̪			031E	o̞		
]	}	0318	o̙			031D	o̝		
\	|								
a	A	0103	ă	0102	Ă	1D90	ɑ᷉	0363	o^{a}
s	S	1D8B	ʃ᷉			1D8A	ʂ᷉		
d	D					1D81	ɖ᷉	0369	o^{d}
f	F					1D82	ɟ᷉		
g	G	011F	ğ	011E	Ğ	1D83	ɡ᷉		
h	H	1E2B	ḫ	1E2A	Ḫ	A795	ɦ᷉	036A	o^{h}
j	J	1D09	ᵢ			1D4E	ᵢ᷉		

k	K	029E	ʞ	A7B0	Ʞ	1D84	kʒ		
l	L	A781	ꞁ	A780	Ꞁ	1D85	lʒ		
;	:								
'	"								
z	Z	01AA	ʅ			1D8E	zʒ		
x	X					1D8D	xʒ	036F	ͮo
c	C					A794	cʒ	0368	ͨo
v	V					1D8C	vʒ	036E	ͮo
b	B					1D80	bʒ		
n	N					1D87	nʒ		
m	M					1D86	mʒ	036B	ͫo
,	<	2221				2222			
.	>	2220				2299		229A	
/	?	21AF				2298			

Key - 0B: Dash Stroke

Dead Key: 0B	E11	-	_	AL u+	AL sym	AU U+	AU SYM
Representative Characters:				0111	đ	0110	Đ
Primary Purpose:				Dash Stroke			
Extended Purpose:				Additional letters with Dash Stroke Hyphen symbols Middle section of composite braces Selected Cyrillic letters Small Letter Long S with High Stroke Modifier Letter Short Equals Sign Arrow-from-Bar math symbols Right-angle arrow symbols Circled numbers from 0 to 9			

How to remember: Refer to – minus sign legend on lower-half of key cap.
Do not confuse _ underscore on -_ key with Key 0C, Macron, which has =+ on it.

The term Stroke is used ambiguously in Unicode. Key 0B is intended for use with horizontal lines through the middle of letters, thus the name Dash Stroke. In Unicode, a horizontal line in a letter is sometimes called a Bar instead of a Stroke. For letters with diagonal lines through them, see Key 39, Slash Stroke.

Held AL = = U+0304 Combining Macron will appear narrower in most fonts than
Held AL – – U+0305 Combining Overline.

Dead AL = = U+0331 Combining Macron Below will appear narrower in most fonts than
Dead AL – – U+0332 Combining Low Line.

Note that combining stroke overlay symbols are on Key = 0C and Combining Overline/Low Line are on Key – 0B, even though Key – 0B is the Dash Stroke dead key. This was done to make it easy to add underlines to letters - a common requirement in several languages, while adding the overlay modifiers is seldom needed.

Note these letters on the U key:
- U+0289 Latin Small Letter U Bar
- U+1D7E Latin Small Capital Letter U With Stroke
- U+1D7F Latin Small Letter Upsilon With Stroke

Depending on the font used, these letters may be hard to distinguish.

Note these similar letters:
- U+0197 Latin Capital Letter Ɪ With Stroke on AU – Ɪ
- U+019A Latin Small Letter L With Bar on AL – L

Depending on the font used, these letters may be very hard to distinguish.

Letter ɨ ɨ with Dash Stroke is also available as Live Key AB ` / BC `
Letter ʉ Ʉ with Dash Stroke is also available as Live Key AB = / BC =
These letters are often used in African languages.

Note the following characters are from Landsmålsalfabetet, a phonetic alphabet for the

transcription of Swedish dialects (see Wikipedia article) and also for the **Teuthonista** phonetic transcription used in German dialectology:

- **U+2C78 Latin Small Letter E with Notch**
- **U+2C79 Latin Small Letter Turned R with Tail**
- **U+2C7A Latin Small Letter O with Low Ring Inside**

These are present in very few fonts.

In some fonts, **U+2010 Hyphen** or **U+2011 Non-Breaking Hyphen** (or both) are not visible. These characters may serve as ***control codes*** that are acted upon by word processors, which may then conditionally display the glyph for the standard **U+002D Hyphen-Minus**. Coverage and behavior of these characters is inconsistent across many applications. Fonts should be tested for availability.

See Dashes and hyphens for more information.

Cyrillic letters with **green background** can be confused with Latin. Use care when typing.

The symbols on ***Held Keys*** 1 to 5 are **Modifier Letter Tone Bars.** These are used for phonetic descriptions of tone-based languages. There are additional symbols, known as **Contour Tones,** that describe ***transitions*** from one tone to another. To obtain these, simply type two Tone Bars next to each other. Unicode-compliant text editors and word processors will automatically merge them together. Because of that, you do not need separate keys for each possible combination. For instance, if you type the Tone Bars ˧ and ˩ together they will be merged into a ˨˩ contour. Most software will allow up to 3 Tone Bars to be merged; Microsoft Notepad and NotePad++ will merge several.

The dash-like symbol on **AL – Spacebar** is **U+00AD Soft Hyphen (SHY)**. This symbol is also available on **Live Key AB –**

SHY may or may not be visible. See Issues regarding Soft Hyphen (SHY) and Non-Breaking Hyphen for more information.

Circled numbers are found on Dead Key – 0B, Dead Key = 0C and Dead Key ' 2A.
See the article Circled numbers for more information on this topic.

The letter on ***Held AA – O*** is **Latin Letter O With Long Stroke Overlay**, and is present in few fonts.

For most languages you encounter, the letter you are more likely to need is on **Dead AA – O**. Lower-case is **U+0275 Latin Small Letter Barred O**, and upper-case is **U+019F Latin Capital Letter O With Middle Tilde**. Despite its name, upper-case is almost always rendered as if it were "***Latin Capital Letter Barred O***". For an **O**-type letter that looks like it has a Middle Tilde, see Cyrillic Fita on Key 06.

Diacritic Symbols	U+	Sym	U+	Sym
Combining Modifiers:	***Held AL – –***		**Dead AL – –**	
	0305	**o̵**	**0332**	**o̲**

Primary/Secondary Literals:	Dead AL – Space		AL – BL –	
	00AD	-		

QWERTY Keys		AA Dead Key Symbols				*AA Held Key Symbols*			
LC key	UC key	AL u+	AL sym	AU U+	AU SYM	AL u+	AL sym	AU U+	AU SYM
`	~								
1	!					02E5	˥	2460	①
2	@	01BB	ƛ			02E6	˦	2461	②
3	#	21B0				02E7	˧	2462	③
4	$	21B1				02E8	˨	2463	④
5	%	21B2				02E9	˩	2464	⑤
6	^	21B3						2465	⑥
7	&	21B4						2466	⑦
8	*	21B5						2467	⑧
9	(							2468	⑨
0	)	2011	NB Hyph			2011	NB Hyph	24EA	⓪
-	_	0332	o̲			0305	ō	2E17	⸗
=	+	2010	-			2010	-	A78A	
q	Q	A757	ꝗ	A756	Ꝗ				
w	W								
e	E	AB33	ꬲ			2C78	ⱸ		
r	R	024D	ɍ	024C	Ɍ	2C79	ⱹ		
t	T	0167	ŧ	0166	Ŧ				
y	Y	024F	ɏ	024E	Ɏ	04B1	ұҰ	04B0	ҰҰ
u	U	0289	ʉ	0244	Ʉ	1D7E	ᵾ	1D7F	ᵿ
i	I	0268	ɨ	0197	Ɨ	1D7C	ᵼ		
o	O	0275	ɵ	019F	Ɵ	A74B	ꝋ	A74A	Ꝋ
p	P	1D7D	ᵽ	2C63	Ᵽ	A751	ꝑ	A750	Ꝑ
[	{	2043				23A8			
]	}	2023				23AC			

\	|					1DC6	ȏ		
a	A								
s	S					1E9D	ſ		
d	D	0111	đ	0110	Đ	1D06	ᴅ		
f	F	A799	ꝼ	A798	Ꝼ	2012	‒		
g	G	01E5	ǥ	01E4	Ǥ				
h	H	0127	ħ	0126	Ħ	2015	―		
j	J	0249	ɟ	0248	Ɉ	025F	ʝ		
k	K	A741	ꝁ	A740	Ꝁ	A745	ꝃ	A744	Ꝃ
l	L	019A	ƚ	023D	Ł	A749	ꝇ	A748	Ꝇ
;	:	02C8	ˈ			02CC	ˌ		
'	"	030D	̍			0329	̩		
z	Z	01B6	ƶ	01B5	Ƶ				
x	X					04FF	ҿ	04FE	Ҿ
c	C	A793	ꞓ	A792	Ꞓ				
v	V								
b	B	0180	ƀ	0243	Ƀ	1D03	ʙ		
n	N					2013	–		
m	M					2014	—		
,	<	21A4				21A5		21B6	
.	>	21A6				21A7		21B7	
/	?	21A8				1DC4	ȍ		

Key = 0C: Macron and Line Below

Dead Key: 0C	E12	=	+	AL u+	AL sym	AU U+	AU SYM
Representative Characters:				1E21	ḡ	1E20	Ḡ
Primary Purpose:				Macron and Line Below			
Extended Purpose:				Dual diacritic letters that include Macron Combining Stroke Overlays Selected Cyrillic letter Cyrillic Modifier letters Math symbols ≛ "Star Equal" and ≙ "Ring Equal" Math symbol ≚ "Equiangular" Double Arrow symbols Multi-dot punctuation Circled numbers from 10 to 19			

How to remember: Imagine = sign as a Macron and a Line Below joined together.
Do not confuse _ underscore legend of Dash Stroke on -_ key with Macron on =+ key.

Held AL = = U+0304 Combining Macron will appear narrower in most fonts than
Held AL – – U+0305 Combining Overline.

Dead AL = = U+0331 Combining Macron Below will appear narrower in most fonts than
Dead AL – – U+0332 Combining Low Line.

The narrower Combining Macron and Combining Macron Below are used by Hyper Keys.

Precomposed letters called Line Below have lines that are usually the same size as the shorter Macron Below combining modifier rather than the wider Line Below combining modifier. So, the Unicode term for these letters is misleading.

Note that combining stroke overlay symbols are on Key = 0C and Combining Overline/Low Line are on Key – 0B, even though Key – 0B is the Dash Stroke dead key. This was done to make it easy to add underlines to letters - a common requirement in several languages, while adding the overlay modifiers is seldom needed.

In some fonts, the combining stroke overlay symbols are centered, and in others they may extend on the right as o̶ does in Calibri. Sometimes these symbols are used as modifiers of individual letters; in other cases they are used to "cross out" entire words or sentences.

Note U+1DCC Combining Macron-Breve symbol on 0 key. This symbol is present in few fonts.

Note U+035E Combining Double Macron symbol o͞ on *AL = 9* key,
and U+035F Combining Double Macron Below symbol o͟ on *AL = 0* key.

> Do not confuse these names with other symbols. Observe that these "double" symbols have a double *width*, rather than having two lines like an = Equal sign. If you need combining symbols above or below that resemble Equal signs, see the assignments for the – and = keys on Key 36 Miscellaneous.

For help in using combining double modifiers, see the article Introduction to combining

diacritics

Depending on the font used and available line spacing, the **Combining Double Macron Below** is susceptible to being truncated. If the symbol does not appear, or is rendered incorrectly, try changing the font or increasing the available line spacing, if possible.

For help in using combining double modifiers, see article Combining Diacritics Complete List.

Note **U+02C9 Modifier Letter Macron** on ***Held Key AU = =*** • This glyph will generally be identical in appearance to the *literal* **U+00AF Macron** described in the **Diacritic Symbols** section below. Because the two symbols may look the same, you would only need to choose one over the other if you had software requirements for a specific code value, or if your font showed a slight difference between them. If these issues don't affect you, the Macron *literal* on **AL = Spacebar** is easier to type.

To use lower-case-only symbols on letter keys, be sure Caps Lock is disabled. Otherwise, you will get incorrect results.

The characters ℵ ℶ ℷ and ℸ on ***AU = A B C*** and ***D*** are **Cardinality math symbols** known as **ALEF, BET, GIMEL** and **DALET**. **ALEF** (or, **ALEPH**) is used to measure the size of sets. The other symbols have similar set-related purposes. Unicode describes these as the **first, second, third** and **fourth transfinite cardinals**. Even though these symbols are derived from the Hebrew alphabet, they are designated as Left-to-Right letters, so you will not have difficulty inserting them into your documents. For more information, see https://en.wikipedia.org/wiki/Aleph_number.

> For persons more familiar with the Greek alphabet, it may be helpful as a memory aid to think of these symbols in terms of the Greek letter names **Alpha, Beta, Gamma** and **Delta**, to remember their key locations on the Macron Dead Key.

Cyrillic Hard/Soft Modifiers at **U+A69C** and **U+A69D** are present in few fonts.

If **Cyrillic Modifier Letter En** at **U+1D78** is not available, it is possible to use **Modifier Letter Capital H** at **U+1D34** as a substitute, which is on ***AU M H.***

Characters that are ***both*** Modifier Letters and Cyrillic have their Unicode values shown with medium blue background, and the letters themselves with orange background.

Cyrillic letters with **green background** can be confused with Latin. Use care when typing.

Circled numbers are found on Dead Key – 0B, Dead Key = 0C and Dead Key ' 2A.
See the article Circled numbers for more information on this topic.

Note the accented **Thorn** symbols on letter **P**.

The letter **H** is ***defective*** with respect to the Line Below accent, since a precomposed letter is available in lower-case, but not in upper-case. As a convenience, an unaccented capital **H** appears below, shown in **yellow on gray background**. If you need this to match the appearance of the lower-case **h̲** letter, you must type **Dead AL = =** after the letter. You can also use Hyper Key **BCU H**, which also adds a Combining Macron Below to **H**.

Diacritic Symbols	U+	Sym	U+	Sym
Combining Modifiers:	*Held AL = =*		Dead AL = =	
	0304	ō	0331	̱
Primary/Secondary Literals:	Dead AL = Space		AL = BL =	
	00AF	¯	02CD	_

QWERTY Keys		AA Dead Key Symbols				*AA Held Key Symbols*			
LC key	UC key	AL u+	AL sym	AU U+	AU SYM	AL u+	AL sym	AU U+	AU SYM
`	~								
1	!							246A	⑪
2	@	224D	≍			226D	≭	246B	⑫
3	#	2056	∺			10FB	⁝	246C	⑬
4	$	2058	∺					246D	⑭
5	%	2059	∺					246E	⑮
6	^					A69D	ᵇ	246F	⑯
7	&							2470	⑰
8	*	225B	≛			2257	≗	2471	⑱
9	(					035E	o͞	2472	⑲
0	)	1DCC	ȍ			035F	o̲	2469	⑩
-	_	0335	o̶			0336	o̶		
=	+	0331	̱			0304	ō	02C9	ˉ
q	Q	01E3	ǣ	01E2	Ǣ				
w	W								
e	E	0113	ē	0112	Ē	1E15	ḕ	1E14	Ḕ
r	R	1E5F	ṟ	1E5E	Ṟ	1E5D	ṝ	1E5C	Ṝ
t	T	1E6F	ṯ	1E6E	Ṯ				
y	Y	0233	ȳ	0232	Ȳ	04EF	ӯ	04EE	Ӯ
u	U	016B	ū	016A	Ū	01D6	ǖ	01D5	Ǖ
i	I	012B	ī	012A	Ī				

o	O	014D	ō	014C	Ō	1E51	ȍ	1E50	Ȍ
p	P	A765	ꝑ	A764	Ꝑ	A767	ꝓ	A766	Ꝓ
[	{	22A2	⊢			22A4	⊤		
]	}	22A3	⊣			22A5	⊥		
\	|	21D6				21D8			
a	A	0101	ā	0100	Ā			2135	
s	S								
d	D	1E0F	ḏ	1E0E	Ḏ	225D		2138	
f	F								
g	G	1E21	ḡ	1E20	Ḡ			2137	
h	H	1E96	ẖ	0048	H	1D78	ʰ		
j	J								
k	K	1E35	ḵ	1E34	Ḵ				
l	L	1E3B	ḻ	1E3A	Ḻ	1E39	ḹ	1E38	Ḹ
;	:	2255				1E7B	ṻ	1E7A	Ṻ
'	"	030E	ȍ			0348	͈		
z	Z	1E95	ẓ	1E94	Ẓ				
x	X								
c	C								
v	V					225A			
b	B	1E07	ḇ	1E06	Ḇ	A69C	ʿ	2136	
n	N	1E49	ṉ	1E48	Ṉ	04E3	ӣ	04E2	Ӣ
m	M					225E			
,	<	21D0				21D1		21D5	
.	>	21D2				21D3		21D4	
/	?	21D7				21D9			

Key W 11: Cyrillic

Dead Key: 11	D02	w	W	AL u+	AL sym	AU U+	AU SYM
Representative Characters:				0448	ш	0428	Ш
Primary Purpose:				Cyrillic			
Extended Purpose:				Triple Arrows			

How to remember: Associate W with the W-like ш Ш Representative Characters.

For Dead Key capital letters assigned to non-letter keys, such as letter ж Ж Zhe on the [key, Caps Lock is not respected. You would have to a Shift. See Capitalization rules for more information.

The Combining Modifiers appearing below are mostly used for Early Cyrillic.

Note: When certain lower-case Cyrillic letters are displayed in *italic font*, their appearance may change dramatically, so that some italic letters will not resemble their non-italic counterparts. For instance, letter г becomes *г* in italic. This is normal and is not an error. The changed appearance of italic letters is related to the historical use of the Cyrillic alphabet with handwritten text. See the Help for more information.

Note that many *Held Key* letters on Key W have either a Descender or Diaeresis accent.

Cyrillic letters occasionally have a combining accent added, which is often the Acute accent.
You can use any standard combining modifier keys to add accents to Cyrillic letters. For instance, to get з'with Acute, type AL W 3 for з then use *AL* ' ' for the Acute accent.

Key 06 has several Cyrillic letters that could not be accommodated on Key W. There are also additional Cyrillic letters defined on other keys.
See Cyrillic Letter Guide for more information.

Although all letters on Key W are Cyrillic, several appearing below with green background can be confused with Latin. For instance, U+04AA Cyrillic Capital Letter Es with Descender and U+04AB Cyrillic Small Letter Es with Descender on key C look just like ç Ç with Cedilla. Use care when typing. A few Cyrillic letters can be also confused with Greek, such as letter п П on key V, since much of the Cyrillic alphabet originated from Greek. These are not marked, but care is likewise needed when typing.

Notice how the characters on keys 1 to 8 resemble the digits 1 to 8.

Font availability of U+290x vertical Triple Arrows may be limited. To remember these arrow symbols, note the 3 'prongs' on top of the letter W. Then associate W to arrows and W key.

Key W has no literals, and no combining modifiers on the Dead Key itself.

QWERTY Keys		AA Dead Key Symbols				*AA Held Key Symbols*			
LC key	UC key	AL u+	AL sym	AU U+	AU SYM	AL u+	AL sym	AU U+	AU SYM
`	~					0485	ȯ		
1	!	A647	ꞹ	A646	Ꞹ	0479	ȣ	0478	Ȣ
2	@	044D	э	042D	Э	04ED	ӭ	04EC	Ӭ
3	#	0437	з	0417	З	04DF	ӟ	04DE	Ӟ
4	$	0447	ч	0427	Ч	04B7	ҷ	04B6	Ҷ
5	%	0452	ђ	0402	Ђ	045B	ћ	040B	Ћ
6	^	0431	б	0411	Б	044C	ь	042C	Ь
7	&	0433	г	0413	Г	04F7	ґ	04F6	Ґ
8	*	A64B	ꙋ	A64A	Ꙋ	046F	ѯ	046E	Ѯ
9	(					0487	͡ȯ		
0	)	0444	ф	0424	Ф	0471	ѱ	0470	Ѱ
-	_					0483	ȱ		
=	+	0467	ѧ	0466	Ѧ	046B	ѫ	046A	Ѫ
q	Q	04E9	ө	04E8	Ө	04EB	ӧ	04EA	Ӧ
w	W	0448	ш	0428	Ш	0449	щ	0429	Щ
e	E	0435	е	0415	Е	0451	ё	0401	Ё
r	R	044F	я	042F	Я	04C4	ӄ	04C3	Ӄ
t	T	0442	т	0422	Т	04AD	ҭ	04AC	Ҭ
y	Y	0443	у	0423	У	04F1	ӱ	04F0	Ӱ
u	U	0446	ц	0426	Ц	045F	ҵ	040F	Ҵ
i	I	0456	і	0406	І	0457	ї	0407	Ї
o	O	043E	о	041E	О	04E7	ӧ	04E6	Ӧ
p	P	0440	р	0420	Р	048F	ҿ	048E	Ҿ
[	{	0436	ж	0416	Ж	0497	җ	0496	Җ
]	}	04C2	ӝ	04C1	Ӝ	04DD	ӜӜ	04DC	ӜӜ
\	|	0469	ѩ	0468	Ѩ	046D	ѭ	046C	Ѭ

a	A	0430	а	0410	А	04D3	ä	04D2	Ä
s	S	0455	ѕ	0405	Ѕ	04A9	ҩ	04A8	Ҩ
d	D	0434	д	0414	Д	04B5	ҵ	04B4	Ҵ
f	F	0493	ғ	0492	Ғ	04FB	ӻ	04FA	Ӻ
g	G	04D9	ә	04D8	Ә	04DB	ӛ	04DA	Ӛ
h	H	043D	н	041D	Н	04A3	ҥ	04A2	Ҥ
j	J	0458	ј	0408	Ј	04C8	ӈ	04C7	Ӈ
k	K	043A	к	041A	К	049B	ҟ	049A	Ҟ
l	L	043B	л	041B	Л	052F	ԯ	052E	Ԯ
;	:					0484	҆		
'	"	A65F	ꙟ	A65E	Ꙟ	0486	҇		
z	Z	0439	й	0419	Й	048B	ҋ	048A	Ҋ
x	X	0445	х	0425	Х	04B3	ҳ	04B2	Ҳ
c	C	0441	с	0421	С	04AB	ҫ	04AA	Ҫ
v	V	043F	п	041F	П	0525	ԥ	0524	Ԥ
b	B	0432	в	0412	В	044A	ъ	042A	Ъ
n	N	0438	и	0418	И	04E5	ӥ	04E4	Ӥ
m	M	043C	м	041C	М	04CE	ӎ	04CD	Ӎ
,	<	21DA	⇚			290A	⤊		
.	>	21DB	⇛			290B	⤋		
/	?	04BD	ҽ	04BC	Ҽ	04BF	ҿ	04BE	Ҿ

Key [1A: Circumflex Below

Dead Key: 1A	D11	[	{	AL u+	AL sym	AU U+	AU SYM
Representative Characters:				1E19	ệ	1E18	Ệ
Primary Purpose:				Circumflex Below			
Extended Purpose:				Superscript numerics and punctuation Fraction Slash symbol Currency symbols Modifier Turned Comma and Reversed Comma Curved arrow symbols Convenience ŵ Ŵ with Circumflex Script Capitals Dual arrows			

How to remember: Imagine [turned 90 degrees clockwise to form ¯ shape.
Then, associate the ¯ shape with ^ circumflex-below diacritic.

Circumflex Below is primarily used in the Venda language, and as a modifier for letters in the Uralic Phonetic Alphabet (UPA).

Note that superscript numerics and punctuation may be typed either as Dead Keys or as *Held Keys*, whichever is more convenient. As individual symbols, Dead Keys may be easier, while spans of these characters may be easier to type as Held Keys.

Note U+032A Combining Bridge Below symbol on \ key.

Note U+058F Armenian Dram currency symbol ֏ on *AL [A* is present in few fonts.
Note U+0E3F Thai Baht currency symbol ฿ is on *AL / B*

Do not confuse ₡ U+20A1 Colón Sign on *Held Key AL [C* with ₵ U+20B5 Cedi Sign on *Held Key AL] C* or ¢ U+00A2 Cent Sign on Live CL 2 or ₠ ⅊ with Slash Stroke on Dead AA / C

Script Capitals require Shift. Note that Script Capital ℳ was used as a symbol for the German Mark, until this currency was replaced by the Euro. For some reason, the ℘ Script Capital P looks like a lower-case letter in most fonts, even though it is not.

U+5713 Traditional 圓 and U+5706 Simplified 圆 Yuán ideographs may be hard to distinguish; the Simplified symbol is only slightly 'simpler' than the Traditional one.
See Currency symbols for more information.
See Dead Key 1B for additional currency symbols.

The Circumflex Above diacritic is located on Dead Key 06.

Letter ŵ Ŵ with Circumflex Above provides an assist in typing Welsh.

Diacritic Symbols	U+	Sym	U+	Sym

Combining Modifiers:	*Held AL [[*		Dead AL [[	
	032D	o̭	0302	ô
Primary/Secondary Literals:	Dead AL [Space		AL [BL [	
	A788	̭	02C6	ˆ

QWERTY Keys		AA Dead Key Symbols				*AA Held Key Symbols*			
LC key	UC key	AL u+	AL sym	AU U+	AU SYM	AL u+	AL sym	AU U+	AU SYM
`	~								
1	!	00B9	¹			00B9	¹		
2	@	00B2	²			00B2	²		
3	#	00B3	³			00B3	³		
4	$	2074	⁴			2074	⁴		
5	%	2075	⁵			2075	⁵		
6	^	2076	⁶			2076	⁶		
7	&	2077	⁷			2077	⁷		
8	*	2078	⁸			2078	⁸		
9	(	2079	⁹	207D	⁽	2079	⁹	207D	⁽
0	)	2070	⁰	207E	⁾	2070	⁰	207E	⁾
-	_	207B	⁻			207B	⁻		
=	+	207C	⁼	207A	⁺	207C	⁼	207A	⁺
q	Q					17DB			
w	W	0175	ŵ	0174	Ŵ	20A9	₩		
e	E	1E19	ḙ	1E18	Ḙ	20AC	€	2130	ℰ
r	R					20A8	₨	211B	ℛ
t	T	1E71	ṯ	1E70	Ṯ	20BA	₺		
y	Y					5713	圓		
u	U	1E77	ṳ	1E76	Ṳ	1E7B	ṻ	1E7A	Ṻ
i	I					20B9	₹	2110	ℐ
o	O					0CB0	ಠ		
p	P					20BD	₽	2118	℘

[	{	0302	ô			032D	̭		
]	}	0346	ͤ			20E9	⃩		
\	|	032A	̪						
a	A					058F			
s	S					20AA	₪		
d	D	1E13	ḍ	1E12	Ḍ	20AB	₫		
f	F					0192	ƒ	2131	ℱ
g	G					20B2	₲		
h	H					20B4	₴	210B	ℋ
j	J					A838	ꜿ		
k	K					20AD	₭		
l	L	1E3D	ḷ	1E3C	Ḷ	20A4	₤	2112	ℒ
;	:					02BD	ʽ		
'	"					02BB	ʻ		
z	Z								
x	X					20A2	₢		
c	C					20A1	₡		
v	V								
b	B					20BF	฿	212C	ℬ
n	N	1E4B	ṇ	1E4A	Ṇ	20A6	₦		
m	M					20BC	₥	2133	ℳ
,	<	21C7				21C8			
.	>	21C9				21CA			
/	?	2044	⁄			2044	⁄		

Key] 1B: Caron

Dead Key: 1B	D12	]	}	AL u+	AL sym	AU U+	AU SYM
Representative Characters:				01CE	ǎ	01CD	Ǎ
Primary Purpose:				Caron			
Extended Purpose:				Subscript numerics and punctuation Fraction Slash symbol Currency symbols Dual diacritic letters that include Caron Modifier Apostrophe Convenience ẁ Ẁ with Grave Black Letter Capitals Dual/bidirectional arrows			

How to remember: Imagine] turned 90 degrees clockwise to form ␣ shape.
Then, associate the ␣ shape with ˇ caron diacritic.

Note that subscript numerics and punctuation may be typed either as Dead Keys or as *Held Keys*, whichever is more convenient. As individual symbols, Dead Keys may be easier, while spans of these characters may be easier to type as Held Keys.

Notice ľ Ľ with Caron appears to have an Acute accent. L with Acute looks like Í Ĺ instead. There is a similar issue with lower-case ď and ť with Caron also.

Do not confuse ₡ U+20A1 Colón Sign on *Held Key AL [C* with ₵ U+20B5 Cedi Sign on *Held Key AL] C* or ¢ U+00A2 Cent Sign on Live CL 2 or ⅇ ℰ with Slash Stroke on Dead AA / C

The Drachma sign ₯ at U+20AF is sometimes rendered using Δ Delta and ρ Rho as a ligature to represent the first two letters of the Greek word Δραχμή for Drachma. The Unicode symbol for Drachma combines a Latin Capital Letter D with a Greek Small Letter ρ Rho.

Note U+0E3F Thai Baht currency symbol ฿ is on *AL / B*

U+5713 Traditional 圓 and U+5706 Simplified 圆 Yuán ideographs may be hard to distinguish; the Simplified symbol is only slightly 'simpler' than the Traditional one.
See Currency symbols for more information.
See Key 1A for additional currency symbols.

Black Letter Capitals require Shift.

Convenience ẁ Ẁ with Grave is intended as an assist for writing Welsh.

To use lower-case-only symbols on letter keys, be sure Caps Lock is disabled.
Otherwise, you will get incorrect results.

Note U+033A Combining Inverted Bridge Below symbol on \ key.

The letter J is *defective* with respect to the Caron accent, since a precomposed letter is available in lower-case, but not in upper-case. As a convenience, an unaccented capital J appears below, shown in yellow on gray background. If you need this accented, you must add it manually, by

typing *AL]]* after the letter. You can also use Live AC J which is a digraph of J and a Caron.

Note that support for letters with ˇ Caron is distributed among several keys:

Dead Key 02 • convenience keys for letters G, H, j and K with Caron
Dead Key] 1B • contains all Latin Caron letters
Live Key AA • native letters R, T, S, D, Z, C and N with Caron
Live Key AA F • E with Caron
Live Key BB] • G with Caron
Live Key BB ' • L with Caron
Live Key AC J • upper case J with Caron as a digraph (no precomposed J̌ in Unicode)

Diacritic Symbols	U+	Sym	U+	Sym
Combining Modifiers:	*Held AL]]*		Dead AL]]	
	030C	ŏ	032C	ọ̌
Primary/Secondary Literals:	Dead AL] Space		AL] BL]	
	02C7	ˇ	02EC	ˬ

QWERTY Keys		AA Dead Key Symbols				*AA Held Key Symbols*			
LC key	UC key	AL u+	AL sym	AU U+	AU SYM	AL u+	AL sym	AU U+	AU SYM
`	~								
1	!	2081	1			2081	1		
2	@	2082	2			2082	2		
3	#	2083	3			2083	3		
4	$	2084	4			2084	4		
5	%	2085	5			2085	5		
6	^	2086	6			2086	6		
7	&	2087	7			2087	7		
8	*	2088	8			2088	8		
9	(	2089	9	208D	(	2089	9	208D	(
0	)	2080	o	208E	)	2080	o	208E	)
-	_	208B	-			208B	-		
=	+	208C	=	208A	+	208C	=	208A	+

q	Q					0AF1	૱		
w	W	1E81	ẁ	1E80	Ẁ	060B	؋		
e	E	011B	ě	011A	Ě	20A0	₠		
r	R	0159	ř	0158	Ř	FDFC	﷼	211C	
t	T	0165	ť	0164	Ť	20B8	₸		
y	Y					5706	圆		
u	U	01D4	ǔ	01D3	Ǔ	01DA	ǚ	01D9	Ǚ
i	I	01D0	ǐ	01CF	Ǐ	5143	元	2111	
o	O	01D2	ǒ	01D1	Ǒ	0DD4	๊		
p	P					20B1	₱		
[	{								
]	}	032C	̬			030C	̌		
\	|	033A	̺			09F2	৲		
a	A	01CE	ǎ	01CD	Ǎ	20B3	₳		
s	S	0161	š	0160	Š	1E67	ṧ	1E66	Ṧ
d	D	010F	ď	010E	Ď	20AF	₯		
f	F					20A3	₣		
g	G	01E7	ǧ	01E6	Ǧ	20B0	₰		
h	H	021F	ȟ	021E	Ȟ	20B6		210C	
j	J	01F0	ǰ	004A	J	5186	円		
k	K	01E9	ǩ	01E8	Ǩ				
l	L	013E	ľ	013D	Ľ	20BE	₾		
;	:					02EE	ˮ		
'	"					02BC	ʼ		
z	Z	017E	ž	017D	Ž	0BF9		2128	
x	X					20B7	৳		
c	C	010D	č	010C	Č	20B5	₵	212D	
v	V								
b	B					09F3	৻		
n	N	0148	ň	0147	Ň	20BB	₻		
m	M					20A5	₥		

,	<	21C6				21F5			
.	>	21C4				21C5			
/	?	2044	⁄			2044	⁄		

Key \ 1C: Dot Below

Dead Key: 1C	D13	\	|	AL u+	AL sym	AU U+	AU SYM
Representative Characters:				1EA1	ạ	1EA0	Ạ
Primary Purpose:				Dot Below			
Extended Purpose:				Dual diacritic letters that include Dot Below Extender sections of composite closure symbols Selected Math symbols Selected Cyrillic letters			

How to remember: Key lacks a good mnemonic; remember with practice and use.

Note U+20E5 Combining Reverse Solidus Overlay symbol ⃥ on Dead AL \ \ key. To type this symbol, first hold AA while typing \ key, release all keys, then type \ key a second time.

Note U+20E6 Combining Double Vertical Stroke Overlay symbol ⃦ on *Held AU* \ \ key. This may be used to form some types of custom currency symbols. Successful use of this combining symbol is dependent on the font used; many fonts fail to compose it properly.

Note U+20E5, U+20E6, and U+20D2 combining overlay symbols are present in few fonts.

Note U+1D10 Latin Letter Small Capital Open O symbol ᴐ on *AL \ C* may be hard to distinguish from U+0254 Latin Small Letter Open O symbol ɔ on Live Key BL V depending on the font used.

To use special symbols on letter keys, be sure Caps Lock is disabled.
Otherwise, you will get incorrect results.

Letter Ệ with Circumflex and Dot Below was found to have an error in non-bold Calibri font, which incorrectly display as Ễ with Tilde and Dot Below instead. Other Vietnamese letters also had problems. In Windows 10, the Calibri font was updated. Users of Calibri should test to see if these issues are present on their system.

Cyrillic letters with green background can be confused with Latin. Use care when typing.

Cyrillic Letter Reversed DZE on *Held Key AA \ 2* resembles Latin Letter Tone Two on Dead Key X. Because tone letters are seldom used, green background is not used here, but you should be mindful of this, since some scripts have used Cyrillic in the past to serve as tone letters where no corresponding Latin tone letters were available; prevailing practice is not always consistent.

U+04CF Cyrillic Small Letter Palochka and U+04C0 (capital) Cyrillic Letter Palochka on Key I both resemble Latin letter I and *may appear identical to each other* in many fonts. Note also that the capital form does not contain the word Capital in the Unicode documentation. The table below shows this in Roman Cyrillic Std font, which makes a distinction between upper and lower case.

Symbols on key 8 are U+2E0C Left Raised Omission Bracket and U+2E1C Left Low Paraphrase Bracket. Font availability is limited; the samples below are in Times New Roman. Dead Key 39 / has corresponding right-hand symbols.

Diacritic Symbols	U+	Sym	U+	Sym
Combining Modifiers:	*Held AL \ *		Dead AL \ \	
	0323	ọ	20E5	⃥
Primary/Secondary Literals:	Dead AL \ Space		AL \ BL \	

QWERTY Keys		AA Dead Key Symbols				*AA Held Key Symbols*			
LC key	UC key	AL u+	AL sym	AU U+	AU SYM	AL u+	AL sym	AU U+	AU SYM
`	~					2E1F	ⸯ		
1	!								
2	@					A645	ꙅ	A644	Ꙅ
3	#								
4	$	23AE				04B9	ҹ	04B8	Ҹ
5	%								
6	^								
7	&								
8	*	2E0C				2E1C			
9	(	239C							
0	)	239F							
-	_	2340	⅊			1DC5	ᵒ̄		
=	+								
q	Q					1EB7	ᶏ	1EB6	ᶏ
w	W	1E89	ẉ	1E88	Ẉ				
e	E	1EB9	ẹ	1EB8	Ẹ				
r	R	1E5B	ṛ	1E5A	Ṛ	0519	æ	0518	Æ
t	T	1E6D	ṭ	1E6C	Ṭ	20AE	₮		
y	Y	1EF5	ỵ	1EF4	Ỵ	04AF	ᵧ	04AE	Y
u	U	1EE5	ụ	1EE4	Ụ	A661	ᵤ	A660	Ꞟ
i	I	1ECB	ị	1ECA	Ị	04CF	ᵢ	04C0	I

o	O	1ECD	ọ	1ECC	Ọ				
p	P					20A7	₱ts		
[	{	23A2				23AA			
]	}	23A5				23AA			
\	|	20E5	⃝	20D2	⃒	0323	̣	20E6	⃦
a	A	1EA1	ạ	1EA0	Ạ				
s	S	1E63	ṣ	1E62	Ṣ	1E69	ṩ	1E68	Ṩ
d	D	1E0D	ḍ	1E0C	Ḍ				
f	F					1EC7	ệ	1EC6	Ệ
g	G					1EAD	ậ	1EAC	Ậ
h	H	1E25	ḥ	1E24	Ḥ	045A	ҥ	040A	Ҥ
j	J								
k	K	1E33	ḳ	1E32	Ḳ	1ED9	ộ	1ED8	Ộ
l	L	1E37	ḷ	1E36	Ḷ	0459	ҙ	0409	Ҙ
;	:								
'	"								
z	Z	1E93	ẓ	1E92	Ẓ				
x	X	0353	͓			0515	ҳ	0514	Ҳ
c	C					1D10	ɔ		
v	V	1E7F	ṿ	1E7E	Ṿ	1EF1	ự	1EF0	Ự
b	B	1E05	ḅ	1E04	Ḅ	1EE3	ợ	1EE2	Ợ
n	N	1E47	ṇ	1E46	Ṇ	1D0E	ᴎ	1DB0	ᴺ
m	M	1E43	ṃ	1E42	Ṃ				
,	<	22D6	⋖			27D1	⟑		
.	>	22D7	⋗			27C7	⟇		
/	?								

Key ; 29: Diaeresis

Dead Key: 29	C10	;	:	AL u+	AL sym	AU U+	AU SYM
Representative Characters:				1E8D	ẍ	1E8C	Ẍ
Primary Purpose:				Diaeresis			
Extended Purpose:				Dual diacritic letters that include Diaeresis Combining Arrowhead Diacritics Selected math symbols Logic symbols Selected double-struck capital letters Convenience letter L with Dash Stroke Selected Cyrillic letters Chess and Checkers (Draughts) notation			

How to remember: Diaeresis ¨ looks like : turned 90 degrees clockwise.

The **Diaeresis** diacritic is also known as an **Umlaut** or **Trema**. Different languages may use this accent for different purposes. Unicode does not distinguish these language-specific grammatical purposes; it only uses the term **Diaeresis**. Alternate spellings for these words include **Diæresis** or **Dieresis**, and **Tréma**.

Note that ṵ Ṵ on *Held Key U* is the only precomposed letter with **Diaeresis Below**.

There is no official Unicode symbol for a Diaeresis Below **literal**; **U+2025 Two Dot Leader** symbol on **AL ; BL ;** is used as a substitute. Another substitute is to use a space or Non-breaking Space followed by a Combining Modifier Diaeresis Below, which you would have to type manually.

Note **U+1DFE Combining Left Arrowhead** *Above* symbol on **Dead Key <**
Note **U+0350 Combining Right Arrowhead** *Above* symbol on **Dead Key >**
To type these symbols, hold **AA** while typing the semicolon key, then release **AA** and type the comma or period key.

Note **U+0354 Combining Left Arrowhead** *Below* symbol on *Held Key* **<**
Note **U+0355 Combining Right Arrowhead** *Below* symbol on *Held Key* **>**
To type these, *hold AA* while typing the semicolon, then type the comma or period key, and finally release **AA**.

<u>These symbols do not use Shift</u>, but note the relationship between them and the **<** and **>** characters on the same keys.

A small number of African languages use **ṅ Ṅ** with **Diaeresis**. There are no precomposed letters for this. You can compose them manually, using **n** or **N** and then *AA : :* for the combining Diaeresis symbol. Or, you can use the <u>Hyper Keys</u> on **ABC :** and **BCU :** to have them composed for you.

Math symbols ∺ ∸ and ∹ are present in few fonts.

Chess and Checkers (Draughts) entries have a **light green** background. See <u>Chess and games</u> for additional discussion.

Logic symbol entries have a pink background. *Held Key* symbols like ⊬ with a Slash through them represent the negation of the Dead Key symbols like ⊢ to their left in the table.

The letter T is *defective* with respect to the Diaeresis accent, since a precomposed letter is available in lower-case, but not in upper-case. As a convenience, an unaccented capital T appears below, shown in yellow on gray background. If you need this accented, you must add it manually, by typing *AL : :* after the letter.

Notice the Double Struck Capital letters like ℝ below on *Held Key R*. Recent versions of the Unicode standard have defined additional Double Struck Capital letters to fill out the remaining letters A-Z. These additional letters are above the Basic Mapping Plane (BMP) with code point values higher than U+FFFF, and are not supported by the Q Keyboard.

Double Struck letters are used in math notation to signify classes of values, such as ℝ for Real numbers and ℂ for Complex numbers. This Wikipedia article explains such usage.

Diacritic Symbols	U+	Sym	U+	Sym
Combining Modifiers:	*Held AL ; ;*		Dead AL ; ;	
	0308	◌̈	0324	◌̤
Primary/Secondary Literals:	Dead AL ; Space		AL ; BL ;	
	00A8	¨	2025	‥

QWERTY Keys		AA Dead Key Symbols				*AA Held Key Symbols*			
LC key	UC key	AL u+	AL sym	AU U+	AU SYM	AL u+	AL sym	AU U+	AU SYM
`	~	223B	≻̈			01DC	ǜ	01DB	Ǜ
1	!	2A6B	≺̈						
2	@	22AA	⊩						
3	#	205D	⋮			20DB	⃛		
4	$	205E	⋮			20DC	⃜		
5	%	22A2	⊢			22AC	⊬		
6	^	22A8	⊨			22AD	⊭		
7	&	22A9	⊩			22AE	⊯		
8	*	22AB	⊫			22AF	⊮		
9	(	22A6	⊢						
0	)	22A7	⊨						

-	_	00F7	÷						
=	+	2254				01D6	ṻ	01D5	Ṻ
q	Q	2655	♕	265B	♛	211A			
w	W	1E85	ẅ	1E84	Ẅ	26C0		26C1	
e	E	00EB	ë	00CB	Ë				
r	R	2656	♖	265C	♜	211D			
t	T	1E97	ẗ	0054	T				
y	Y	00FF	ÿ	0178	Ÿ				
u	U	00FC	ü	00DC	Ü	1E73	ṳ	1E72	Ṳ
i	I	00EF	ï	00CF	Ï	1E2F	ḯ	1E2E	Ḯ
o	O	00F6	ö	00D6	Ö	022B	ȫ	022A	Ȫ
p	P	2659	♙	265F	♟	2119			
[	{					01DC	ǜ	01DB	Ǜ
]	}					01DA	ǚ	01D9	Ǚ
\	|								
a	A	00E4	ä	00C4	Ä	01DF	ǟ	01DE	Ǟ
s	S								
d	D								
f	F								
g	G								
h	H	1E27	ḧ	1E26	Ḧ	210D			
j	J								
k	K	2654	♔	265A	♚	04A1	ҡ	04A0	Ҡ
l	L	026C	ɬ	A7AD	Ɬ	019A	ƚ	023D	Ł
;	:	0324	̤			0308	̈		
'	"					01D8	ǘ	01D7	Ǘ
z	Z					2124			
x	X	1E8D	ẍ	1E8C	Ẍ				
c	C					2102			
v	V								
b	B	2657	♗	265D	♝	26C2		26C3	

n	N	2658	♘	265E	♞	2115			
m	M								
,	<	1DFE	ȏ			0354	ȏ		
.	>	0350	ȏ			0355	ȏ		
/	?								

Key ' 2A: Acute

Dead Key: 2A	C11	'	"	AL u+	AL sym	AU U+	AU SYM
Representative Characters:				00E1	á	00C1	Á
Primary Purpose:				Acute accent			
Extended Purpose:				Dual diacritic letters that include Acute accent Small Letter ʼn Preceded By Apostrophe Apostrophe-like punctuation letter Saltillo Selected Cyrillic letters Modifier-letter arrow-heads Specialty "plus" symbols OCR symbols from U+244x Circled number 20			

How to remember: Apostrophe ' closely resembles Acute accent ´ symbol.

U+00B4 Acute Accent character ´ can be found on:

- DEAD AL ' Spacebar
- *HELD AL ' ;*
- LIVE AC `

Note U+0341 Combining Acute Tone Mark symbol on ; key. Depending on the font used, this may be difficult to distinguish from U+0301 Combining Acute Accent.

Note U+1DC9 Combining Acute-Grave-Acute may be hard to distinguish from a Combining Tilde in some fonts.

OCR symbols are shown with a violet background. See Help for more information. Font availability for OCR symbols outside of U+2440 through U+2442 is limited.

The "specialty plus signs" and other symbols on the – and = keys were present in the BCDIC character encoding used on older mainframes; font availability is limited.

Note U+22D5 character ⋕ on key 3 is not a "specialty plus sign" but is the Math symbol Equal and Parallel To, which resembles a # pound sign.

If the symbol U+29E7 Thermodynamic ⧧ on AL ' = is not available, the similar-looking symbol U+01C2 Alveolar Click ǂ on AL X = or Not Equal sign ≠ on BU = might be used as a substitute.

U+0149 Latin Small Letter ʼn Preceded By Apostrophe, sometimes seen in Afrikaans, is present on *Held AL ' N* and *Held AL , N* • Regarding this letter, the Unicode standard states, "this character is deprecated and its use is strongly discouraged". The Q Keyboard supports Letter ʼn Preceded by Apostrophe, even though it is deprecated in Unicode, for sake of completeness and because it remains present in the Windows WGL4 character list.

Circled numbers are found on Dead Key – 0B, Dead Key = 0C and Dead Key ' 2A.
See the article Circled numbers for more information on this topic.

Letters D and T do not take Acute. However, D and T with Caron have lower-case forms ď and ť that strongly resemble Acute accents. Letter L does take Acute, but also has a lower-case Caron

form ʼ that likewise resembles an Acute accent.

Diacritic Symbols	U+	Sym	U+	Sym
Combining Modifiers:	*Held AL ' '*		Dead AL ' '	
	0301	o'	0317	o̗
Primary/Secondary Literals:	Dead AL ' Space		AL ' BL '	
	00B4	´	02CF	ˏ

QWERTY Keys		AA Dead Key Symbols				*AA Held Key Symbols*			
LC key	UC key	AL u+	AL sym	AU U+	AU SYM	AL u+	AL sym	AU U+	AU SYM
`	~	244A	⑊			1DC9	ᵒ̃		
1	!	2441	⊣						
2	@	2442	⊢						
3	#	2443	⊥			22D5			
4	$	2444	⊡						
5	%	2445	⋇						
6	^	2446	⋮						
7	&	2447	⋰			0453	ґ	0403	Ґ
8	*	2448	⋱						
9	(	2449	⋯						
0	)	2440	⋰					2473	⑳
-	_	29FA				29FB			
=	+	29E7	⧺			22B9			
q	Q	01FD	ǽ	01FC	Ǽ	1EAF	ắ	1EAE	Ắ
w	W	1E83	ẃ	1E82	Ẃ				
e	E	00E9	é	00C9	É	1E17	ḗ	1E16	Ḗ
r	R	0155	ŕ	0154	Ŕ	02B6	ʸ		
t	T								
y	Y	00FD	ý	00DD	Ý	04F3	ӱ	04F2	Ӱ

u	U	00FA	ú	00DA	Ú	01D8	ǘ	01D7	Ǘ
i	I	00ED	í	00CD	Í				
o	O	00F3	ó	00D3	Ó	1E53	ṓ	1E52	Ṓ
p	P	1E55	ṕ	1E54	Ṕ				
[	{	A78C	ꞌ			A78C	ꞌ		
]	}	A78B				A78B			
\	|					22BA	⊤		
a	A	00E1	á	00C1	Á	01FB	ǻ	01FA	Ǻ
s	S	015B	ś	015A	Ś	1E65	ṥ	1E64	Ṥ
d	D					A663	ꙁ	A662	Ꙁ
f	F					1EBF	ế	1EBE	Ế
g	G	01F5	ǵ	01F4	Ǵ	1EA5	ấ	1EA4	Ấ
h	H								
j	J								
k	K	1E31	ḱ	1E30	Ḱ	1ED1	ố	1ED0	Ố
l	L	013A	ĺ	0139	Ĺ	A665	ꙁ	A664	Ꙁ
;	:	0341	ó			00B4	´	02CF	ˏ
'	"	0317	ọ			0301	o'	02CA	ˊ
z	Z	017A	ź	0179	Ź				
x	X					2717	✗		
c	C	0107	ć	0106	Ć				
v	V					1EE9	ứ	1EE8	Ứ
b	B					1EDB	ớ	1EDA	Ớ
n	N	0144	ń	0143	Ń	0149	ʼn		
m	M	1E3F	ṁ	1E3E	Ṁ	A667	ꙁ	A666	Ꙁ
,	<	02F1	˂			02F0	˄		
.	>	02F2	˃			02EF	˅		
/	?					2713	✓		

Key X 31: Extra

Dead Key: 31	B02	x	X	AL u+	AL sym	AU U+	AU SYM
Representative Characters:				0253	ɓ	0181	Ɓ
Primary Purpose:				Extra letters used in African scripts and others			
Extended Purpose:				Small Capital letters Phonetic clicks and modifier colons ! ǂ ǀ ǁ ː ˑ Subset and Superset math symbols Solid Arrow/Triangle symbols Unicode bidirectional text control codes Left/right and up/down arrows			

How to remember: Refer to letter X in Extra.

Dead Key 07 is primarily for the Vietnamese Hook Above and for letters with Retroflex (right-curving) Hooks. Dead Key X is for Hook letters like Ɓ that are often used in African languages.

Dead Key AA X can be used to insert Unicode bidirectional text control codes.
These codes require unique, non-standard key sequences, and are not described below.
See the Help article here for more information.

Note that AA X space is *not a literal symbol*, but is U+00A0, the Non-breaking space.
See Spacing and joining symbols for more information. This works the same whether typed as a Dead Key or *Held Key*, and regardless of whether Shift is held.

Symbols on keys 2 through 6 and 8 are letters that resemble digits.
See *AA \ 2* for Cyrillic letters that resemble digit 2
See AA W 3 and AA W 4 for Cyrillic letters that resemble digits 3 and 4

See AA W 6, *AA W 6*, AA 6 B and AA 8 B for Cyrillic letters similar to what is on key 6 below with ƀ ƃ

Small Capital S and F are present in few fonts.

Small Capital Q is expected in Unicode version 11, scheduled for June 2018.
The symbol that appears in the table is an approximation. If you type the key sequence shown below, the correct Unicode value will be produced, but it will not display properly unless you have an updated font that contains this new letter. Update: This letter now can be found on the most recent version of the Roman Cyrillic Std font.

Small Capital ɫ is on *AL / L*
Small Capital ʙ is on *AL – B*
Small Capital ᴅ is on *AL – D*
Small Capital ᴐ is on *AL \ C*
Small Capital ɴ is on *AL \ N*

U+A7AB Latin Capital Letter Reversed Open E on key 3 is present in few fonts.
U+A7AE Latin Capital Letter Small Capital ɪ is present in few fonts.

Latin letter ə Ə Schwa on AA X X is also available as a Live Key on BB ` (grave).

- To type ə as a Dead Key, hold AA and type X, then release AA and type X a second time.
- To type Ə as a Dead Key, hold AA and type X, then release AA, hold Shift and type X a second time.

Capital Ə can be typed using Early Shift or Late Shift, and it respects Caps Lock.

Latin Alpha ɑ Ɑ is on AA X A below. Latin Turned Alpha ɒ D is on AA M Q.

U+02A0 ɋ Latin Small Letter Q with Hook is on Dead Key AL 7 Q
U+024B ɋ Latin Small Letter Q with Hook Tail is on Dead Key AL X Q below.

Symbol × on *Held AL X X* is U+00D7 Multiplication Sign, not a letter X. This symbol is also available on Live Key CU 8

Phonetic click symbols are shown with violet background.

Key X has no literals, and no combining modifiers on the Dead Key itself.

QWERTY Keys		AA Dead Key Symbols				*AA Held Key Symbols*			
LC key	UC key	AL u+	AL sym	AU U+	AU SYM	AL u+	AL sym	AU U+	AU SYM
`	~								
1	!	01C3	!						
2	@	01A8	ƨ	01A7	Ƨ				
3	#	025C	ɜ	A7AB	Ɜ				
4	$	0265	ɥ	A78D	Ɥ				
5	%	01BD	ƽ	01BC	Ƽ				
6	^	0185	ƅ	0184	Ƅ				
7	&								
8	*	0223	ȣ	0222	Ȣ				
9	(	2282	⊂	2286	⊆	2284	⊄	2288	⊈
0	)	2283	⊃	2287	⊇	2285	⊅	2289	⊉
-	_					2194	↔		
=	+	01C2	ǂ						
q	Q	024B	ɋ	024A	Ɋ	A7AF	ꝏ	1D01	ᴁ
w	W	2C73	ⱳ	2C72	Ⱳ	1D21	ᴡ		
e	E	025B	ɛ	0190	Ɛ	1D07	ᴇ		

r	R	027D	ɽ	2C64	Ɽ	0280	ʀ	0281	ʁ
t	T	01AD	ƭ	01AC	Ƭ	1D1B	ᴛ		
y	Y	01B4	ƴ	01B3	Ƴ	028F	ʏ		
u	U	028A	ʊ	01B1	Ʊ	1D1C	ᴜ		
i	I	0269	ɪ	0196	Ɩ	026A	ɪ	A7AE	Ɪ
o	O	0254	ɔ	0186	Ɔ	1D0F	ᴏ		
p	P	01A5	ƥ	01A4	Ƥ	1D18	ᴘ	0276	ɶ
[	{								
]	}								
\	|	01C0	|			2195	↕		
a	A	0251	ɑ	2C6D	Ɑ	1D00	ᴀ		
s	S	0283	ʃ	01A9	Σ	A731	ꜱ		
d	D	0257	ɗ	018A	Ɗ	1D05	ᴅ		
f	F	0192	ƒ	0191	Ƒ	A730	ꜰ		
g	G	0260	ɠ	0193	Ɠ	0262	ɢ	029B	ɢ
h	H	0266	ɦ	A7AA	Ɦ	029C	ʜ		
j	J	029D	ɟ	A7B2	Ʝ	1D0A	ᴊ		
k	K	0199	ƙ	0198	Ƙ	1D0B	ᴋ		
l	L	026C	ɬ	A7AD	Ɬ	029F	ʟ		
;	:	02D0	ː						
'	"	02D1	ˑ						
z	Z	01B9	ʒ	01B8	Ʒ	1D22	ᴚ		
x	X	0259	ə	018F	Ə	00D7	×	02DF	˟
c	C	0188	ƈ	0187	Ƈ	1D04	ᴄ		
v	V	028B	ʋ	01B2	Ʋ	1D20	ᴠ		
b	B	0253	ɓ	0181	Ɓ	0299	ʙ		
n	N	0272	ɲ	019D	Ɲ	0274	ɴ	1DAE	ᵰ
m	M	0271	ɱ	2C6E	Ɱ	1D0D	ᴍ	1DAC	ᵯ
,	<	25C4	◀			25B2	▲		
.	>	25BA	▶			25BC	▼		
/	?	01C1	‖			00F7	÷		

Key M 36: Miscellaneous

Dead Key: 36	B07	m	M	AL u+	AL sym	AU U+	AU SYM
Representative Characters:				026F	ɯ	019C	Ɯ
Primary Purpose:				Miscellaneous letters and symbols			
Extended Purpose:				Modifier letters Modifier-letter arrowheads Character "tie" symbols Latin Script G Apothecary symbols including Rx Dual exclamation/question symbols			

How to remember: Refer to letter M in Miscellaneous and Modifier.

Note that *Held Keys* for M are modifier letters, not combining diacritics.
That is indicated by the absence of an o or ◌ in displaying these letters in the table below.

Key = has U+0333 Combining Double Low Line and U+0347 Combining Equals Sign Below.
These similar-looking symbols have different widths in various fonts. U+0347 is often narrower than U+0333, but can be the same size or wider, depending on the font.

Note that AA M space is *not a literal symbol*, but is U+202F, the Narrow non-breaking space.
See Spacing and joining symbols for more information. This works the same whether typed as a Dead Key or *Held Key*, and regardless of whether Shift is held.

AA M H is Latin letter Heng, available in few fonts.
For similar Cyrillic letter En with Hook ԩ Ԩ use *AA W J*

To use lower-case-only symbols on letter keys, be sure Caps Lock is disabled.
Otherwise, you will get incorrect results.

Colon-like symbol on : key may or may not look different than standard ASCII : colon, depending on the font used.

The symbols on AL M ' and *AL M '* are *Modifier Letter* Prime and Double Prime, not regular primes.

The lower-case f on *AU M F* is U+AB35 Latin Small Letter Lenis F, an archaic letter.

Latin Turned Alpha ɒ D is on AA M Q below; notice how this resembles the letter D.
Latin Alpha ɑ Ɑ is on AA X A

U+02A0 ɋ Latin Small Letter Q with Hook is on Dead Key AL 7 Q
U+024B ɋ Latin Small Letter Q with Hook Tail is on Dead Key AL X Q

See article on Apothecary symbols for more information on ℞ on key R and symbols on keys 2 to 6. For user convenience, the ℞ symbol works the same whether shifted or not.

The Greek-like math symbols ∑ Sigma (Summation), Ω Omega (Ohm), U-like µ Mu (Micro) and ∏ Pi (Product) are shown as white on purple background, and may be remembered by the

acronym SOUP. These symbols are also on Live Key M.

Characters on keys [ ] and \ are math symbols ⊷ IMAGE OF, ⊶ ORIGINAL OF and ⊸ MULTIMAP.

The *Held Key* ligatures on the numeric row like ꜲO are Medieval Nordic vowels.

U+AB53 Latin Small Letter Chi on AL M X may not appear in the Help display.

U+1D7B Latin Small Capital Letter ᴉ with Stroke on key ᴉ below does not have an official upper-case form. Instead, Dead AU M ᴉ below has U+0197 Latin Capital Letter I with Stroke. To type a conventional letter ᴉ with Dash Stroke, see Key - 0B: Dash Stroke. This letter is also available as a Live Key on AB ` and BC `

The ∑ character below is a math Sigma or Summation symbol. To type an African letter ʃ Σ Sigma, use the Extra S letter on Key X 31: Extra.
The Summation symbol is also available on Live Key BL M

Key M has no literals, and no combining modifiers on the Dead Key itself.

QWERTY Keys		AA Dead Key Symbols				*AA Held Key Symbols*			
LC key	UC key	AL u+	AL sym	AU U+	AU SYM	AL u+	AL sym	AU U+	AU SYM
`	~	02F4	ˋ			1D4A	ᵊ		
1	!	203C	‼			2049	⁉		
2	@	2108	℈			A733	ꜳ	A732	Ꜳ
3	#	2125	℥			A735	ꜵ	A734	Ꜵ
4	$	264F	♏			A737	ꜷ	A736	Ꜷ
5	%	264D	♍			A739	ꜹ	A738	Ꜹ
6	^	2114	℔			A73B	ꜻ	A73A	Ꜻ
7	&					A73D	ꜽ	A73C	Ꜽ
8	*								
9	(	2054				2040			
0	)	203F				2050			
-	_	02ED	˭			033F	o̿		
=	+	2017	‗			0333	o̳	0347	o̬
q	Q	0252	ɒ	2C70	Ⱓ	1D45	ᵃ		

w	W	0195	ƕ	01F6	Ƕ	02B7	ʷ	1D42	ᵂ
e	E	01DD	ə	018E	Ǝ	1D49	ᵉ	1D31	ᴱ
r	R	211E	℞	211E	℞	02B3	ʳ	1D3F	ᴿ
t	T					1D57	ᵗ	1D40	ᵀ
y	Y	1EFF	ỿ	1EFE	Ỿ	02B8	ʸ		
u	U	00B5	µ			1D58	ᵘ	1D41	ᵁ
i	I	1D7B	ᵻ	0197	Ɨ	2071	ⁱ	1D35	ᴵ
o	O	2126	Ω			1D52	ᵒ	1D3C	ᴼ
p	P	220F	∏			1D56	ᵖ	1D3E	ᴾ
[	{	22B7				1D4B	ᵋ		
]	}	22B6				1D53	ᵓ		
\	|	22B8				1D9F	ᶟ		
a	A	0250	ɐ	2C6F	Ⱬ	1D43	ᵃ	1D2C	ᴬ
s	S	2211	∑			02E2	ˢ		
d	D	0256	ɖ	0189	Ð	1D48	ᵈ	1D30	ᴰ
f	F	0278	ɸ			1DA0	ᶠ	AB35	ꬵ
g	G	0261	ɡ	A7AC	Ɡ	1D4D	ᵍ	1D33	ᴳ
h	H	A727	ɧ	A726	ɧ	02B0	ʰ	1D34	ᴴ
j	J	0284	ʝ			02B2	ʲ	1D36	ᴶ
k	K					1D4F	ᵏ	1D37	ᴷ
l	L					02E1	ˡ	1D38	ᴸ
;	:	A789	꞉						
'	"	02B9	′			02BA	″		
z	Z	01BA	ƺ			1DBB	ᶻ		
x	X	AB53	χ	A7B3		02E3	ˣ		
c	C	A73F	ɔ	A73E	Ɔ	1D9C	ᶜ		
v	V	028C	ʌ	0245	Ʌ	1D5B	ᵛ	2C7D	ⱽ
b	B	A7B5		A7B4		1D47	ᵇ	1D2E	ᴮ
n	N	019E	ɳ	0220	Ƞ	207F	ⁿ	1D3A	ᴺ
m	M	026F	ɯ	019C	Ɯ	1D50	ᵐ	1D39	ᴹ
,	<	02C2	˂			02C4	˄		
.	>	02C3	˃			02C5	˅		

/	?	2047	??			2048	?!		

Key , 37: Cedilla and Horn

Dead Key: 37	B08	,	<	AL u+	AL sym	AU U+	AU SYM
Representative Characters:				00E7	ç	00C7	Ç
Primary Purpose:				Cedilla and Horn			
Extended Purpose:				U and O with Horn Dual diacritic letters with Cedilla S and T with Comma Below Small Letter ʼn Preceded By Apostrophe Math symbols ⩽ ≦ ≲ ≰ ≪ Three-dot ellipsis … Top sections of composite closure symbols Convenience Combining Dot Below symbol Selected Cyrillic letters			

How to remember: Comma , resembles ¸ Cedilla diacritic.

For Comma Below combining symbol, use AL , ,
For Comma Below literal symbol, use a regular comma, though this should not be needed.

Note these specialized *comma-like* combining modifiers on J and L:
Held AL , J has o̡ U+0321 Combining Palatalized Hook Below
Held AL , L has o̢ U+0322 Combining Retroflex Hook Below

If you look closely, you will see that the Palatalized Hook curves to the left, like letter J, and the Retroflex Hook curves to the right, somewhat like letter L. The similarity in shapes may help you to remember which keys they are on. These modifiers are used mostly by linguists.

Note the various types of Comma Above combining accents on keys 6, 7, 8 and 9.
Digits 6 and 9 closely resemble the shapes of the comma symbols associated with those keys.
Digit 7 *somewhat* resembles a Comma Above Right.
A *possible* substitution for Comma Above Right might be superscript 9, as in o⁹.
Key 8 must simply be remembered, since the symbol bears no resemblance to digit 8.

These are enlarged here to show detail:

Held AL , 6	U+0312	o̒	Combining Turned Comma Above
Held AL , 7	U+0315	o̕	Combining Comma Above Right
Held AL , 8	U+0314	o̔	Combining Reversed Comma Above
Held AL , 9	U+0313	o̓	Combining Comma Above

U+0149 Latin Small Letter ʼn Preceded By Apostrophe, sometimes seen in Afrikaans, is present on *Held AL ' N* and *Held AL , N* • Regarding this letter, the Unicode standard states, "this character is deprecated and its use is strongly discouraged". The Q Keyboard supports Letter ʼn Preceded by Apostrophe, even though it is deprecated in Unicode, for sake of completeness and because it remains present in the Windows WGL4 character list.

Symbol U+02DE on *AL , R* is ˞ Modifier Letter Rhotic Hook. Although it is not designated as a

"combining" symbol *per se*, it will "attach" itself to the preceding letter as if it were. There are two precomposed Rhotic letters. These are U+025A ɚ and U+025D ɝ on Key 08.

Note that Dead Keys S and T have Cedilla, while *Held Keys* S and T have Comma Below. These letters are also available as Live Keys.

The Cedilla dead key is also used as a Horn dead key for letters ơ Ơ and ư Ư. Most typists will likely prefer the Live Key versions of these letters, on AA B and AA V respectively. When needed, U+031B Combining Horn accent can be found on *Held AL , M*

Diacritic Symbols	U+	Sym	U+	Sym
Combining Modifiers:	*Held AL , ,*		Dead AL , ,	
	0327	̧	0326	̦
Primary/Secondary Literals:	Dead AL , Space		AL , BL ,	
	00B8	¸		

QWERTY Keys		AA Dead Key Symbols				*AA Held Key Symbols*			
LC key	UC key	AL u+	AL sym	AU U+	AU SYM	AL u+	AL sym	AU U+	AU SYM
`	~								
1	!								
2	@								
3	#					0499	ȝ	0498	Ȝ
4	$	2320				23B2	⎷		
5	%								
6	^					0312	̓		
7	&					0315	̕		
8	*					0314	̔		
9	(	239B				0313	̓		
0	)	239E							
-	_								
=	+	2A7D	⩽	2266	≦	2272	≲		
q	Q								

w	W								
e	E	0229	ę	0228	Ę	1E1D	ę̆	1E1C	Ę̆
r	R	0157	ŗ	0156	Ŗ	02DE	ɾ		
t	T	0163	ţ	0162	Ţ	021B	ț	021A	Ț
y	Y								
u	U	01B0	ư	01AF	Ư				
i	I								
o	O	01A1	ơ	01A0	Ơ				
p	P								
[	{	23A1				23A7			
]	}	23A4				23AB			
\	|								
a	A								
s	S	015F	ş	015E	Ş	0219	ș	0218	Ș
d	D	1E11	ḍ	1E10	Ḍ				
f	F								
g	G	0123	ǵ	0122	Ģ				
h	H	1E29	ḥ	1E28	Ḥ	04CA	ӈ	04C9	Ӈ
j	J					0321	ҕ		
k	K	0137	ḳ	0136	Ḳ	045C	ќ	040C	Ќ
l	L	013C	ḷ	013B	Ḷ	0322	ҕ		
;	:								
'	"								
z	Z								
x	X					04FD	ҳ	04FC	Ҳ
c	C	00E7	ç	00C7	Ç	1E09	ḉ	1E08	Ḉ
v	V								
b	B								
n	N	0146	ṇ	0145	Ṇ	0149	ʼn		
m	M					031B	ơ		
,	<	0326	ọ			0327	ҕ	226A	≪
.	>	2026	…			02BB	ʻ		

/	?	2270							

Key . 38: Dot Above

Dead Key: 38	B09	.	>	AL u+	AL sym	AU U+	AU SYM
Representative Characters:				0227	ȧ	0226	Ȧ
Primary Purpose:				Dot Above, dotless i and j letters			
Extended Purpose:				Dual diacritic letters that include Dot Above Math symbols ⩾ ≧ ≳ ≯ ≫ Bottom sections of composite closure symbols Other math symbols Spacing symbols En Quad and Em Quad Combining Horn Above Symbol Convenience K U and V with Dot Below Convenience Capital Ɨ with Dash Stroke			

How to remember: Refer to . period legend on lower-half of key cap.

Unicode does not define a Dot Above form for L. As a convenience, L with Middle Dot l· L· is used instead on Dead Key . L • This letter is also available on Live Key BB ;

Note that on Dead AL . I the dot is *removed* from lower-case ı while on Dead AU . I the dot is *added* to capital İ. This is used in Turkish and related languages.

Note that on Dead AL . J the dot is *removed* from lower-case dotless ȷ. This letter is used in the special íȷ digraph for Dutch.

Note U+0358 Combining Dot Above Right symbol on *Held AU . /* key.

Combining Dot Above can be applied *twice* to simulate a ȯ Colon Above diacritic mark. Use of a Colon Above diacritic is rare, but is occasionally needed by linguists. Because placing one modifier on top of another is an unusual way to use combining accents, you need to test your font to make sure it will work correctly.

Depending on the font used, U+0307 Combining Dot Above and U+0358 Combining Dot Above Right may be hard to distinguish.

To use lower-case-only symbols on letter keys, be sure Caps Lock is disabled. Otherwise, you will get incorrect results.

Letters K U and V have no Dot Above forms. For convenience, the Dot Below forms are assigned instead. Also, lower-case dotless ȷ has no upper-case equivalent such as a dotted upper-case J. As a substitute, Capital Ɨ with Dash Stroke is defined instead. These substitutions, shown in black with yellow background, can assist users with Lisu Fraser transcription.

On the *AL . 6* key, in Roman Cyrillic Std font, U+A71A Modifier Letter Lower Right Corner Angle is rendered with an incorrect glyph. Roman Cyrillic Std used the same symbol as U+A717 Modifier Letter Dot Vertical Bar that appears on the *AL . * key. The U+A71A symbol is shown below correctly in Calibri font. Update: In the most recent version of the Roman Cyrillic Std font, this issue has been corrected.

Most Spacing Symbols are on Key 39.

Note these symbols on quote key and comma key are present in few fonts:

- **U+2E41 Reversed Comma**
- **U+2E42 Double Low-Reversed-9 Quotation Mark**
- **U+2E32 Turned Comma**

Diacritic Symbols	U+	Sym	U+	Sym
Combining Modifiers:	*Held AL . .*		Dead AL . .	
	0307	ȯ	0323	ọ
Primary/Secondary Literals:	Dead AL . Space		AL . BL .	
	02D9	˙		

QWERTY Keys		AA Dead Key Symbols				*AA Held Key Symbols*			
LC key	UC key	AL u+	AL sym	AU U+	AU SYM	AL u+	AL sym	AU U+	AU SYM
`	~					2E1E	⸛		
1	!	2250	≐			2024	‧		
2	@	2251	≑			2025	‥		
3	#								
4	$	2321				23B3	⎛		
5	%								
6	^					A71A	ˬ		
7	&								
8	*	22C5	⋅						
9	(	239D				0352	͒		
0	)	23A0				0310	̐		
-	_	22EF	⋯			A719	˖	2238	∸
=	+	2A7E	⪾	2267	≧	2273	≳	2214	∔
q	Q								
w	W	1E87	ẇ	1E86	Ẇ				
e	E	0117	ė	0116	Ė				

r	R	1E59	ṙ	1E58	Ṙ				
t	T	1E6B	ṫ	1E6A	Ṫ				
y	Y	1E8F	ẏ	1E8E	Ẏ				
u	U	1EE5	ụ	1EE4	Ụ				
i	I	0131	ı	0130	İ				
o	O	022F	ȯ	022E	Ȯ	0231	ȱ	0230	Ȱ
p	P	1E57	ṗ	1E56	Ṗ				
[	{	23A3				23A9			
]	}	23A6				23AD			
\	|	22EE	⋮	22F1	⋱	A717	Ꜿ		
a	A	0227	ȧ	0226	Ȧ	01E1	ǡ	01E0	Ǡ
s	S	1E61	ṡ	1E60	Ṡ	1E9B	ẛ		
d	D	1E0B	ḋ	1E0A	Ḋ				
f	F	1E1F	ḟ	1E1E	Ḟ				
g	G	0121	ġ	0120	Ġ				
h	H	1E23	ḣ	1E22	Ḣ	0523	ԣ	0522	Ԣ
j	J	0237	ȷ	0248	Ɉ	025F	ɟ		
k	K	1E33	ḳ	1E32	Ḳ				
l	L	0140	ŀ	013F	Ŀ	0521	ԡ	0520	Ԡ
;	:	2234	∴			2235	∵		
'	"	2E41	⸁			2E42	⸂		
z	Z	017C	ż	017B	Ż				
x	X	1E8B	ẋ	1E8A	Ẋ				
c	C	010B	ċ	010A	Ċ				
v	V	1E7F	ṿ	1E7E	Ṿ	04A7	ҧ	04A6	Ҧ
b	B	1E03	ḃ	1E02	Ḃ				
n	N	1E45	ṅ	1E44	Ṅ	2000	En Quad		
m	M	1E41	ṁ	1E40	Ṁ	2001	Em Quad		
,	<	02BC	ʼ			02BB	ʻ	2E32	⸢
.	>	0323	ạ			0307	ȯ	226B	≫
/	?	2271		22F0	⋰	A718	ꜘ	0358	͘

Key / 39: Slash Stroke

Dead Key: 39	B10	/	?	AL u+	AL sym	AU U+	AU SYM
Representative Characters:				2C65	ⱥ	023A	Ⱥ
Primary Purpose:				Slash Stroke and Oblique Stroke			
Extended Purpose:				Additional letters with Slash or Oblique Stroke Small Letter Long S With Diagonal Stroke Spacing and Joining symbols as Held Keys Thai Baht currency symbol ฿ on Held Key B Math symbols ≮ and ≯ and others Caret Insertion Point U+2041 Reversed Question Mark			

How to remember: Refer to / slash legend on lower-half of key cap.

The term Stroke is used ambiguously in Unicode. Dead Key 39 is intended for use with diagonal lines through the middle of letters, thus the name Slash Stroke.
For letters with horizontal lines through them, see Key 0B, Dash Stroke.

Note the combining modifiers on the / key:
- U+0337 Combining Short Solidus Overlay
- U+0338 Combining Long Solidus Overlay

These Solidus modifiers are present in few fonts, and often do not "overlay" the / mark in the center of the base letter, but tend to place it to its right like this o̸ which you may find unattractive. If you plan to use these modifiers, be sure to test them for usefulness and suitability. In particular, if your intent was to "slash" a letter, as if changing a one like O into Ø using one of these Solidus modifiers, in nearly all cases it will not work.

To type the Reversed Question mark symbol on *AU / ?* hold AA+Shift and type the ? key twice.

Note: The Thai Baht currency symbol ฿ should not be used for Bitcoin. Instead, use Capital Ƀ with Dash Stroke on AC B or the official Bitcoin symbol on *AL [B.* See Currency symbols for more information.

To use lower-case-only symbols on letter keys, be sure Caps Lock is disabled.
Otherwise, you will get incorrect results.

Spacing symbols En Quad and Em Quad are on *AL . N* and *AL . M* respectively.

Do not confuse ₵ U+20A1 Colón Sign on *Held Key AL [C* with ₵ U+20B5 Cedi Sign on *Held Key AL] C* or ¢ U+00A2 Cent Sign on Live CL 2 or ȼ Ȼ with Slash Stroke on Dead AA / C

Note these special Unicode formatting characters:

- *Held AU / R* U+FFFD Replacement Character (RC)
- *Held AU / P* U+2029 Paragraph Separator (PS)
- *Held AU / L* U+2028 Line Separator (LS)

The usability of these characters may vary by application. The Replacement Character may or

may not have a visible glyph; when present, it is often a question mark inside a diamond. Note these characters require **Shift**.

Dead Key AL / 6 is ˄ **Caret Insertion Point**.
See **Dead Key AL 6 /** for ^ **Caret**.

Symbols on key **8** are **U+2E0D Right Raised Omission Bracket** and **U+2E1D Right Low Paraphrase Bracket**. Font availability is limited; the samples below are in Times New Roman. Dead Key 1C \ has corresponding left-hand symbols.

Latin Letter U with Slash Stroke is expected in Unicode version 11, scheduled for June 2018. The symbols that appear in the table are approximations. If you type the key sequences shown below, the correct Unicode values will be produced, but they will not display properly unless you have an updated font that contains these new glyphs. **Update**: As of February 2019, these letters can be found on the most recent version of the Roman Cyrillic Std font.

Latin Letter Thorn with Diagonal Stroke on letter **P** is **pending approval** by the Unicode Consortium. The expected code point values are shown below. The symbols that appear in the table are approximations. If you type this letter, the indicted Unicode values will be produced, but they will not display properly unless you have an updated font that contains the new glyphs. Since the letter is pending approval, adoption by font vendors may take some time, and it is possible that the Unicode values could change before approval. If the code values change or the letter has its approval withdrawn, a future revision to the Q Keyboard will be required.

For questions on this new Thorn symbol, you should consult the list of proposed characters for Unicode at http://www.unicode.org/alloc/Pipeline.html. As of February 2019, its status was "not accepted by UTC, but in active ISO technical ballot (or on hold for ballot)".

Diacritic Symbols	U+	Sym	U+	Sym
Combining Modifiers:	*Held AL / /*		Dead AL / /	
	0338	̸	0337	̷
Primary/Secondary Literals:	Dead AL / Space		AL / BL /	
	2215	∕		

QWERTY Keys		AA Dead Key Symbols				*AA Held Key Symbols*			
LC key	UC key	AL u+	AL sym	AU U+	AU SYM	AL u+	AL sym	AU U+	AU SYM
`	~								
1	!	2241	≠						
2	@	2249	≉						

3	#					2004	3/M Sp		
4	$					2005	4/M Sp		
5	%					205F	Math Sp		
6	^	2041	ˊ			2006	6/M Sp		
7	&								
8	*	2E0D				2E1D			
9	(								
0	)								
-	_	233F	≠			1DC7	ő		
=	+	2262				225F	≟		
q	Q	A759	q̓	A758	Q̓				
w	W					2060	WJ		
e	E	0247	ɇ	0246	Ɇ	212F	℮		
r	R	A7A7	ꭇ	A7A6	ꭇ	211F		FFFD	RC
t	T	2C66	ⱦ	023E	Ⱦ	2009	Thin Sp		
y	Y								
u	U	A7B9	ꭎ	A7B8	ꭎ				
i	I								
o	O	00F8	ø	00D8	Ø	01FF	ǿ	01FE	Ǿ
p	P	A7C1	ꝿ	A7C0	Ꝿ	2008	Punct Sp	2029	PS
[	{	2223				02D5	˕		
]	}	2225				02D4	˔		
\	|	2224				2226			
a	A	2C65	ⱥ	023A	Ⱥ				
s	S	A7A9	ꞅ	A7A8	Ꞅ	1E9C	ẞ		
d	D								
f	F					2007	Fig Sp		
g	G	A7A1	ꞡ	A7A0	Ꞡ				
h	H	1D7A	ᵺ			200A	Hair Sp		
j	J								
k	K	A7A3	ꝁ	A7A2	Ꝁ	A743	ꝁ	A742	Ꝁ
l	L	0142	ł	0141	Ł	1D0C	ᴌ	2028	LS

;	:	00A0	NBSP			00A0	NBSP		
'	"	202F	NNBSP			202F	NNBSP		
z	Z	035B	ȣ			200B	ZW Sp		
x	X	033D	ȸ						
c	C	023C	ȼ	023B	Ȼ	034F	CGJ		
v	V	A75F	ꝿ	A75E	Ꝿ	2123			
b	B	2422	␢			0E3F	฿		
n	N	A7A5	ꞥ	A7A4	Ꞥ	2002	En Sp		
m	M					2003	Em Sp		
,	<	226E				200D	ZWJ		
.	>	226F				200C	ZWNJ		
/	?	0337	̸			0338	̸	2E2E	⸮

Part 9: List of supported languages

The table below contains a detailed description of the information summarized in Language statistics and Live Key Conformant languages.

As noted in those articles, the information here is derived from the Omniglot web site. At the time this was compiled, a few of the Omniglot entries were not counted because they were aliases of other languages, or were categorized as using Latin alphabets when they actually did not.

> The Omniglot web site is actively maintained and corrected. While the list of languages below is extensive and is a good representative sample, it is neither a list of all Latin languages in existence, nor all languages present on Omniglot, as a number have been added to their web site since this list was first compiled. New languages of all sorts are added to the Omniglot list at a rate of roughly 5-10 per month.
>
> If you have questions on any language not in this list, it is recommended that you search for it on Omniglot or other available resource works, and check the letters required against those provided by the Q Keyboard. You can use the Live Key and Dead Key guides, or the list of symbols in the Appendix. A check of several recent additions to Omniglot did not turn up any letters that were unsupported by the keyboard. Additionally, an analysis of 880 Excel alphabet files, provided by the author of Omniglot, confirmed that all letters in all Latin and Cyrillic languages described on the Omniglot web site as of March 1, 2018 were supported on the Q Keyboard.

The column labeled **L/O** contains "Y" if the language is Latin Only, using only unaccented Latin letters A-Z.

The column labeled **DK** shows the number of **Dead Keys**, ***Held Keys*** and composed keys required to type the language, where a "composed key" means a base letter plus one or more combining diacritics. Composed keys are required when a language uses a letter that has no such precomposed Unicode form, such as **ȧ with Dot Above**. A **DK** value of **0** means the language is **Live Key Conformant**, meaning that it is possible to be typed using only **Live Keys** plus the basic letters on the U.S. QWERTY keyboard. For a given accented letter, the pair of glyphs for upper and lower case like **Ö** and **ö** count as 1 letter key.

Generally, only lower-case letters are shown as examples, unless a letter might be ambiguous. That usually only affects the letters **I** and **L** since their upper-case and lower-case forms could be confused, depending on the font in use.

The numbers of speakers shown below are round-number estimates, for comparison purposes only. Determining accurate language population statistics is often difficult. Some figures are known to be out of date by one or more years. Languages with very large populations, like Spanish, will tend to increase in the number of speakers over time,

while very small populations are usually a sign of a language in decline or endangered, which will likely continue to decline without intervention of some kind.

Where the number of speakers ends in "9", like 99 or 999, these should be treated as educated guesses; accurate statistics for these languages were not available.

Where the number of speakers is shown as 0, it means the language is extinct, or perhaps is an artificial or constructed one that has been abandoned, and may have no native, fluent or active speakers remaining.

Note about the Kazakh language

In 2018, a new Latin alphabet for Kazakh was proposed, which is not based on Turkish as its older Latin alphabet was, but uses a new system of acute accents and the dotless I. The new Kazakh alphabet, assuming the final form retains these features, is fully supported by the Q Keyboard. Both the Turkish-based alphabet and the newly proposed one are Live Key Conformant. For more information on the Kazakh language, see http://www.omniglot.com/writing/kazakh.htm.

Language	Speakers	L/O	DK	Live Keys	Dead/Held Keys	Composed Keys
Abenaki	200		0	ô		
Acehnese	3,500,000		0	é è ë ö ô ’		
Acholi	800,000		0	ŋ		
Achuar-Shiwiar	5,000		0	ã ẽ ĩ ũ ñ		
Adzera	30,000		0	ŋ ’		
Afaan Oromo	30,000,000	Y				
Afar	460,000	Y				
Afrikaans	20,000,000		0	ê î ô û ë		
Aguaruna	45,000		4	’		ạ ẹ ị ụ
Ainu	1	Y				
Ajië	5,000		1	â é è ë ê ô ö û		r̂
Akan	7,000,000		0	ɔ ɛ		
Aklan	500,000	Y				
Akurio	100		0	ɔ ɛ à		
Alabama	100		1		ɨ	
Albanian	8,000,000		0	ç ë â ê ô ä ë ã ẽ ĩ õ ũ ỹ		
Aleut	300		1	ǧ		x̂
Algonquin	3,000		0	à è ì ò		
Alsatian	100,000		0	ä ö ü é ä ü		
Alur	1,400,000		0	ŋ		
Amahuaca	250		0	č š		
Amarakaeri	500		5	’		ạ ẹ ị ọ ụ
Amarasi	80,000	Y				

Amele	5,300	Y				
Amis	180,000		0	ŋ ^ '		
Angami	130,000		0	ü		
Anuki	900	Y				
Anutan	250		0	ŋ		
Apache	15,000		5	ą-ų á-ú Ł		acute+ogonek
Arabela	50		0	á é í ó ú ñ š		
Aragonese	30,000		0	á é í ó ú ü l·l n·n '		
Araki	8		4			m̈ p̈ v̈ r̄
Aranese	5,000		0	acute, grave, ï ü ç		
Arapaho	1,000		0	acute, circum, 3 '		
Arawak	2,500	Y				
Arbëresh	100,000		0	ë		
Are	1,200	Y				
Arikara	10		0	č š ʼ á é í ó ú		
Aromanian	300,000		0	ã lj nj		
Arrernte	3,000	Y				
Arvanitic	30,000		0	acute ç ë lj nj		
Ashéninka	26,000		0	č ʼ		
Ashéninka	50,000		0	acute ñ		
Assiniboine	150		3	ąęįǫų ʼ ʔ ǧ		ȟ ċ ṡ
Asturian	550,000		1	áéíóú ñ		ḥ
Atayal	84,000		0	ə ŋ ʔ		
Atikamekw	5,900	Y				
Awara	1,900		0	ä		
Awing	19,000		5	ɛ ə ʼ ɔ á à â ʉ ɨ	ǎěǐǒǔ	
Aymara	2,200,000		0	ä ï ü ñ ʼ áéíóú		
Azeri	32,000,000		0	ç ə ğ ıİ ö ü ş		
Babine-Witsuwit'en	430		0	ë ï ʼ		
Bambara	3,000,000		0	ɛ ŋ ɲ ɔ		
Bandial	13,000		1	áéíóú č ŋ ñ	ƥ	
Baniwa	6,000	Y				
Barai	800	Y				
Bari	750,000		4	ŋ ö ' ʼ ʻ		ḛ ḭ ṏ ṵ
Bartangi	3,000		0	č đ ǧ ġ š ž þ ẋ ā ē ī ō ū		
Bashkir	1,500,000		0	ä ç ğ í ıİ ñ ö ş ü ź		
Basque	660,000		0	ñ ç		
Bavarian	13,000,000		0	à å ä é è ö ü ẽ êîôû		
Beaver	160		5	ogonek ʼ		line below
Belarusian	7,500,000		0	ć č ź ž ł ń ś š ŭ		
Beli	65,000		0	ä ë ï ö ' ɔ		
Bemba	3,600,000	Y				
Bikol	2,400,000	Y				
Biloxi	0		0	ogonek		

Bislama	200,000	Y				
Blagar	12,000	Y				
Bolinao	51,000	Y				
Bora	2,300		0	ñ ɨ		
Bouyei	2,600,000	Y				
Brahui	2,200,000		0	á í ú ń ŕ ź đ ş ǵ ŧ ḷ		
Breton	210,000		0	ã â ê ü ù c’h		
Bugis	4,000,000		0	ə ’		
Buhutu	1,400	Y				
Bundjalung	200	Y				
Burushaski	87,000		5	áéíóú ć ś ġ		ẓḍṭṵ
Busa	110,000		2	ã ẽ ĩ õ ũ ɛ ɔ		ɛ̃ ɔ̃
Bushi	800,000		1	’ ã ŋ ɓ ɗ		Ṅ
Caddo	25		0	acute grave ’		
Caquinte	300		0	č ñ ’		
Catalan	9,500,000		0	ç ü acute grave		
Cayuga	100		4	ę ǫ : ’		acute+ogonek
Cebuano	20,000,000	Y				
Central Sinama	100,000		0	ā ē ī ō ū		
Chamorro	50,000		0	å ñ '		
Cha'palaachi	3,000		1	ã ẽ ĩ ũ ñ ’ ɨ		ɨ̃
Cape Verdean Creole	1,200,000		0	circum acute tilde		
Chavacano	600,000		0	ñ		
Chechen	1,000,000		2	ə ä ċ ç ġ ẋ ŋ ö ş ü ƶ		ç̇ q̇
Cheyenne	2,000		0	acute dot hat ' š		
Chinanteco	80,000		2	ë ï ö ñ ø '		ą ǫ
Cimbrian	2,200		0	ó ò ö ô etc.		
Chichewa	12,000,000		0	acute hat ŵ ,		
Chickasaw	1,000		9	acute '		ą i ǫ u + duals
Chilcotin	800		0	ġ ž š ’		
Chinook	0		0	š ẋ ’ á ú		
Chipewyan	3,000		2	ą ę ị ǫ ụ ł ’ ë ɛ ʔ		ę̈ ę
Chippewa	7,000	Y				
Chiwere	0		3	^ ñ acute grave	ⁿ ʔ ŋ	
Choctaw	7,000		5		ʊ	ą i ǫ ʊ
Chuukese	50,000		0	acute		
Cocopah	300		2	ł š ʔ	ṣ ṭ	
Coeur d'Alene	0		6	ə ’ č š l’ ʔ ’	ɑ ǰ ʷ ɬ ʕ	x̣
Cofán	1,000		0	ñ ’ û		
Comanche	900		7	acute ʔ ʉ		ą ę i ǫ u ʉ ʉ'
Comorian	700,000	Y				
Comox	36		9	æ č ɛ ə ɔ	ᶿ ɩ ǰ ɬ θ	many
Cornish	3,000		0	ā ē ō ū ű ý		
Corsican	340,000		0	â grave		

Creek	4,700		0	ē ą ę ǫ		
Croatian	5,500,000		0	ć č dž đ lj nj š ž		
Crow	4,400		0	acute hat ' ʔ		
Cubeo	6,300		2	ã ẽ ĩ õ ũ đ ñ ʉ ɨ		ɨ̃ ʉ̃
Cuyonon	100,000	Y				
Cypriot Arabic	3,600		2	ġ ċ ş	δ θ	
Czech	10,000,000		0	acute ČĚŇŘŠŤŽ Ů		
Dagaare	1,100,000		3	ɛ ɔ ʼ ŋ ɓ	ʊ ɩ ɣ	
Dagbani	800,000		0	ɛ ɣ ŋ ɔ ʼ ʒ		
Dalmatian	0		0	grave acute ç		
Danish	5,500,000		0	æ ø å		
Dawan	600,000		0	acute hat ü		
Deg Xinag	300		0	ʼ ł ñ ç ɕ		
Delaware	0		0	grave ë '		
Dhao	5,000		0	è '		
Dholuo	3,000,000	Y				
Dinka	2,000,000		2	ä ë ï ö ɛ ɔ ɣ ŋ		ɛ̈ ɔ̈
Dolgan	1,000		1	ž ń ö ü č š	ŝ	
Dongotono	5,000		0	ŋ ʼ		
Drehu	12,000		0	ë ö ō		
Duala	88,000		5	ɛ ɔ ŋ acute	caron	
Dusun	500,000	Y				
Dutch	20,000,000		0	ij ĵ á à â ä etc.		
Edo	1,000,000		8	á à â etc.	ẹ ọ	ẹ'ọ'ẹ̀ ọ̀ ệ ộ
Efik	2,400,000		7	ñ á à ä â etc.	bʲ caron ọ	
Elfdalian	2,500		2	ą ę ị ų ð ä ö å		ą̊ y̨
Emilian-Romagnol	1,700,000		2	á à â ā å ż	ṅ ṡ	
Esperanto	100,000		5	ŭ	ĉ ŝ ĝ ĥ ĵ	
Estonian	1,100,000		0	õ ä ö ü š ž		
Ewe	3,000,000		2	ɛ ɣ ŋ ɔ á à â ã ʋ	ɖƉ ǎ	
Ewondo	500,000		1	ə ɛ ɔ ŋ á à â	ǎ	
Extremaduran	200,000		0	ç ñ ü acute		
Eyak	0		5	ł ʼ č · š ə	x̣ ʔ ạ ị	Ꞡ
Fala	11,000		0	áéíóú ãẽĩõũ ç ü		
Fanagalo	300,000	Y				
Faroese	50,000		0	á ð íóúý æ ø		
Fijian	650,000		0	macron		
Fiji Hindi	400,000	Y				
Filipino	70,000,000		0	ñ á à ä â etc.		
Finnish	5,000,000		0	å ä ö		
Flemish	6,000,000		0	ij ĵ á à â ä etc.		
Folkspraak	1		0	âêîôû đ ŧ		
Fon	2,500,000		1	ɛ ɔ ò	ɖƉ	
Fox	1,000		0	â ê î ô û		

Franco-Provençal	140,000		0	âêîôû é è		
French	300,000,000		0	ç áàäâ etc. æ œ ’		
French Guianese Creole	150,000		0	ç áàäâ etc. æ œ ’		
Frisian	500,000		0	ú ù ü û etc. å		
Friulian	500,000		0	ç âêîôû		
Fula(ni)	13,000,000		2	ŋ ñ ' ɲ ɓ ɗ	y ɠ	
Fur	900,000		9	ñ ŋ ʉ ɨ á â etc.	ă etc.	ạ
Futunan	5,000		0	ā ē ī ō ū ’		
Ga	600,000		2	ɛ ɔ ã ẽ ĩ õ ẽ ŋ		ɛ̃ ɔ̃
Gagauz	400,000		0	ä ö ü ê ç iİ ıI ş ţ		
Galician	3,000,000		0	ñ áéíóú		
Gallo	28,000		0	ç á à ä â etc.		
Gamilaraay	35	Y				
Ganda	3,000,000		0	ŋ '		
Garifuna	200,000		0	ñ ü áéíóú		
Garo	800,000	Y				
Genoese	450,000		0	æ ç é ô ê à		
German	200,000,000		0	ä ö ü ß		
Gooniyandi	100	Y				
Greenlandic	57,000		0	æ ø å		
Guadeloupean Creole	430,000		0	é è ò		
Guambiano	23,000		0	ø ç ñ š		
Guanano	3,000		1	ãẽĩõũ ʔ ɨ		ɨ̃
Guarani	4,600,000		1	ãẽĩõũỹ ñ äëïöü		g̃
Guaymí	170,000		0	ä ö ü ñ		
Guernésiais	1,500		0	french		
Gugadja/Kukatja	300		3	ŋ : :	d̠ l̠ r̠	
Gwich'in	700		0	å Ł ' ’ à ą etc.		
Haida	50		4	áéíóú	ĝ	g̠ k̠ x̠
Haitian Creole	12,000,000		0	è ò		
Halkomelem	300		9	ə ’ č š áéíóú ʔ	ʷ ɬ ƛ ṁ ṅθ ẇ ẏ	L̓ l̓ x̌ l̓ ṁ ṅ q̓
Hän	15		1	ä Ł à â ą	ă	
Hausa	44,000,000		3	ɓ ɗ ’	ƙ y	r̃
Hawaiian	8,000		0	āēīōū ‘		
Herero	130,000		3		ḏ	ṣ ẓ
Hiligaynon	11,000,000	Y				
Hixkaryana	550		0	á à ɨ		
Hopi	5,000		0	ö ’		
Hotcąk	1,000		0	ą j ų š ž ' ğ		
Hungarian	15,000,000		0	áéíóú öü őű		
Huasteco	150,000		0	áéíóú '		
Hupa	30		0	: ’ Ł		
Iban	700,000		0	ə		
Ibibio	2,000,000		3	ñ ə	ị ọ ʌ	

Icelandic	300,000		0	áéíóúý ð ö þ æ		
Ido	2,000	Y				
Ifugao	130,000	Y				
Igbo	18,000,000		6	ñ	ị ọ ụ	ị'ọ'ụ'
Ikizu	55,000		0	ʉ ɨ '		
Iloko	10,000,000	Y				
Inari Saami	300		0	á â å ä ö č š ž		
Indonesian	170,000,000	Y				
Ingrian	500		0	š ž ä ö		
Interglossa	0	Y				
Interlingua	0	Y				
Interslavic	0		0	many		
Iñupiaq	10,000		2	ġ ł ŋ ñ	ḷ	ł̣
Irish	1,700,000		0	áéíóú		
Ishkashimi	999		9	áéíóú č ċ ë ğ ġ š ů ž ż	ḍ ḷ ṡ ṭ ʸ ь ƀ ɣ	ů'
Istriot	400		0	á à â etc.		
Italian	60,000,000		0	á à â etc.		
Iu Mien	840,000	Y				
Ixil	140,000		1	’	ẍ	
Jamaican	4,000,000	Y				
Jaminjung	200	Y				
Jarai	330,000		8	ă č đ ê ñ ô ơ ư ŭ	ƀ ĕ ĭ ŏ	ẽ õ ŏ ŭ
Javanese	80,000,000		4	å á à â etc. ś	ṇ ṣ ḍ ṭ	
Jèrriais	3,000		0	french		
Jicarilla	700		4	áéíó Ł		ą ę ı̨ ǫ
Jingulu	60	Y				
Jita	210,000	Y				
Ju|’hoan	35,000		9	š ž ç ãõũ âôû ’	! | ‖ ǂ	m̩ ą̣ ǫ̣ ạ ọ ạ̃ ọ̃ ậ ộ
Juhuri	100,000		1	ç ş ə ħ	ḫ	
Kabyle	8,000,000		9	many	many	
Kadazandusun = Dusan						
Kagayanen	30,000	Y				
Kaingang	30,000		0	ãẽĩũỹ áéó ’		
Kakabai	900		1		ḡ	
Kala Lagaw Ya	4,000		3	á à ä ā etc. œ ă	ĕ ĭ ŏ	
Kam	1,500,000	Y				
Kambari	650,000		1	ɓ ɗ		ą
Kanasi	2,200	Y				
Kaninuwa	300		1		ḡ	
Kanuri	4,000,000		2		Ɍ əƎ	
Kapampangan	3,000,000	Y				
Kapingamarangi	3,000	Y				
Kaqchikel	500,000		0	äëïöü ’		
Karaim	60		5	ç ş ƶ č ž ö š ü	ɯ ɵ ь ė	ŋ
Karakalpak	410,000		0	ıi ’		

Karamojong	370,000		0	ŋ ’		
Karbi	420,000	Y				
Karelian	120,000		0	Finnish		
Karuk	40		1	č š áéíóú Í ʔ	θ	
Kashaya	99		2	: ’ š Ľ ʔ	ʰ ṭ	
Kashinawa	1,600		0	ã ẽ ĩ ũ ’		
Kashubian	200,000		0	ą ã é ë ł ń ó ò ô ù ż		
Kaurna	0		0	āēīū ä ’		
Kazakh	11,000,000		0	Turkish		
Kerinci : NOT LATIN						
Ket	550		2	ā æ ç ē ə ī ŋ ṇ ō ş ū ƶ	ɧ ь	
Khakas	60,000		2	ç ə ị ɵ ş ƶ ṇ	ɑ ь	
Khasi	1,600,000		0	ï ñ š ʔ		
Khoekhoe	250,000		4	á à ā ã ä etc.	! | ‖ ǂ	
Khufi	800		0	č đ ğ ġ š þ ẋ ž		
Ki'che'	900,000	Y				
Kickapoo	800		1	áéíóú	θ	
Kikuyu	6,600,000		0	ĩ ũ		
Kinyarwanda	7,000,000	Y				
Kiribati	70,000	Y				
Kirundi	4,500,000	Y				
Kituba	5,400,000	Y				
Klallam	5		4	áéíóú č ə ŋ š ’ ʔ	ʷ ɬ ’ ƛ	x̣
Klamath	99		9	č ’ ŋ ľ ʔ	ɢ ǰ ɴ	ḱ ṁ ṅ ṗ q̇ ṡ ṭ ẇ ẏ
Koasati	99		0	: ą ị ǫ Ł š ’		
Kolam : NOT LATIN						
Kongo	9,000,000	Y				
Konkani	2,500,000	Y				
Koti	65,000	Y				
Koya : NOT LATIN						
Koyukon	300		0	ł ʔ ʉ		
Kumyk	430,000		2	ç ŋ ɵ ş ƶ ’	ɑ ь	
Kuna	50,000	Y				
Kupa : UNDEFINED						
Kurdish	26,000,000		1	ç é ê ú û í î	ẍ	
Kurti	3,000	Y				
Kven	8,000		0	Finnish		
Kwakiutl	200		5	’ Ł ´	◌́	a k x g
Laalaa	12,000		1	é í ó ú ë ŋ ñ ɓ ɗ ’	ɣ	
Ladin	30,000		1	ć š ś ž á à ä â etc.	ṣ	
Lahu	600,000	Y				
Lampung	1,500,000		1		ʁ	
Latin	9,999		0	æ œ āēīōū		
Latino sine Flexione	0	Y				

Latgalian	200,000		0	āēīōū ģ ķ ļ ņ č š ž		
Latvian	1,400,000		0	āēīōū ģ ķ ļ ņ č š ž		
Lingala	5,500,000		9	ɛ ɔ á â etc.	ǎ etc.	ɛ'ɛ̂ ɛ̌ ɔ'ɔ̂ ɔ̌
Lingua Franca Nova	0	Y				
Ligurian = Genoese						
Limburgish	1,600,000		0	’ á à ä â etc.		
Lithuanian	3,200,000		0	ąęįų č š ž ū ė		
Livonian	0		5	āēīōū ä õ šž ļ ņ ŗ ţ	ā̃ ḑ ȯ ō̰ õ̰	
Llanito	999		0	ñ ’ â ä á etc.		
Lojban	0	Y				
Lombard	999		0	’ á à â etc.		
Lotuko	140,000		0	ęǫų ŋ ’ á à etc.		
Low Saxon	3,000,000		0	German		
Lozi	600,000		0	ñ ’		
Lule Sámi	2,000		0	á ä å ñ ń		
Luseño	5		0	áéíóú ð ñ ’		
Lushootseed	300		5	’ č ə Ľ Ł š ʔ	ˣ ʷ ǰ ƛ	x̌
Luxembourgish	400,000		0	ä ë é ’		
Maasai	900,000		0	á à â etc.		
Machiguenga	6,200		0	ñ ’		
Madurese	14,000,000	Y				
Makasarese	2,100,000	Y				
Makhuwa	2,500,000		0	àèìòù		
Malagasy	17,000,000		1	ô		ṅ
Malay	18,000,000	Y				
Maltese	420,000		0	ċ ġ ħ à ’ ż		
Mam	500,000		1	’	ẍ	
Manado Malay	850,000	Y				
Mandar	500,000	Y				
Mandinka	1,300,000		0	ñ ŋ		
Maninka	3,300,000		0	ŋ ɲ ɛ ɔ		
Mankanya	70,000		1	ë ñ ŋ ş ţ ŧ	ƒ	
Manx	199		0	ç ’		
Maore	80,000		1	ã ɓ ɗ		v̄
Māori	140,000		0	āēīōū		
Mapuche	300,000		3	ñ ü ’	l̠ n̠ t̠	
Maranao	800,000	Y				
Marba	150,000		1	ã ä ẽ ə ĩ ï ŋ ö ũ ’ ɓ ɗ ɨ áà etc.	ɦ ʿH	
Marshallese	23,000		2	ā ļ ō ū ṇ ñ		ṃ ọ
Masbateño	600,000		0	ñ á à â etc.		
Massachusett	0		0	á â etc.		
Mauritian Creole	1,200,000		0	á à etc.		
Mazahua	130,000		7	ɵ ’ ‘ ñ ʉ		ạ e̱ i̱ o̱ u̱ ạ̶ e̶
Mazatec	200,000		0	äëïöü ' ´		

Matigsalug	50,000	Y				
Mbula	2,500		0	ŋ		
Mbum	50,000		1	ŋ āēīōū ãẽĩũ ɓ ɗ	ƒ	
Megleno-Romanian	5,000		3	ă Ľ ń ș ț āēīōū ęǫ Ł š	ạ ọ	i̯
Mescalero-Chiricahua	1,500		5	ąęįǫų Ł ’ `		acute+ogonek
Miami	500		0	š		
Mikasuki	500		3	Ł á à etc.		a̧ ę̧ ǫ̧
Mi'kmaq	8,000		0	áéíóú ’ ɨ		
Minangkabau	8,500,000		0	ē ñ		
Mirandese	15,000		0	ç áéíóú êô ũ ’		
Miskito	180,000		0	â î û		
Mixtec	500,000		0	ñ ’ ɨ		
Mizo	700,000		9	ʔ áàäâ etc.	ȧ ạ ă etc.	
Mòcheno	1,600		0	è ò ’		
Mohawk	3,400		0	: ' á à etc.		
Mohegan	0		0	á ô '		
Monégasque	5,000		0	œ ü ç ’ àèìòù		
Montagnais	9,000		1	âîû	ᵘ	
Montenegrin	234,000		0	ć č dž đ lj nj š ž		
Moriori	0		0	āēīōū		
Mossi	60,000		2	ãẽ ɛ ʊ ’	ɩ̃ ʊ̃	
Mro : NOT LATIN						
Muna	300,000	Y				
Mundari	2,000,000		5	ā	ṅ ṭ ḍ ṇ ḷ	
Murrinh-Patha	1,500	Y				
Murui Huitoto	3,000		0	ñ ɨ		
Nagamese	300,000	Y				
Nahuatl	1,500,000		0	āēīō ñ		
Nama = Khoekhoe						
Nanti	250	Y				
Narim	3,600		0	ẽĩõũ		
Naskapi	500		0	âîû		
Nauruan	7,000		0	ã õ ũ ñ		
Navajo	120,000		4	ąęįǫ ’ Ł áéíóú		acute+ogonek
Naxi	300,000	Y				
Ndebele	999	Y				
Ndrumbea	300		2		ḏ ṇ	
Neapolitan	8,000,000		0	’ á à etc.		
Nenets	27,000		8	ç ə ḷ ṇ ṛ ş ţ ŋ	ḍ ḥ ƀ ė	ḇ ṃ ṗ ẓ
Ngiyambaa	10	Y				
Nheengatu	8,000		0	Portuguese		
Nias	770,000		1	ö ’	β	
Niuean	10,000		0	āēīōū		
Nkore	2,300,000	Y				

Noon	33,000		1	ë ŋ ’ ñ ƀ ɗ	ɣ	
Noongar	8,000		0	:		
Norn	0	Y				
Norwegian	5,000,000		0	ç æ ø å áàäâ etc.		
North Frisian	9,999		0	ā ä å ē đ ð ö ü		
Northern Paiute	700	Y				
Northern Pomo	0		2	’ ʔ	ʰ	ṯ
Northern Sámi	25,000		0	á č đ ŋ š ŧ ž lj nj		
Northern Sotho	4,200,000		0	ê ô š		
Novial	0	Y				
Nuer	800,000		8	ä ë ö ɛ ɔ ŋ ɣ		ạ ẹ ị ọ ɛ̈ ɛ̣ ɛ̈ ɔ̣
Nuosu (Yi)	5,000,000	Y				
Nuu-Chah-Nulth (Nootka)	200		9	ċ č Ł ŋ š ’ ʔ	ḥ ʷ ƛ ṁ ṅ ṗ ṫ ẇ ẏ ʕ ḫ ḵ	č ḱ ḷ ƛ q̇ x̣ ċ ṁ ṅ ṗ ṭ ẇ ƛ
Nuxalk	20		9	Ł ċ ' ’ ʔ	ʷ ṗ ṭ	ḱ q̇ ƛ x̣ ċ ṗ
N‖ng	10		5	âîôû ’	! ǂ | ‖ ʘ	
Occidental	0	Y				
Occitan	6,000,000		0	ç á à etc.		
Okinawan	980,000	Y				
Onondaga	50		3	ñ ’ ë ą̨ǫ : áéíóú		ë'ą̨'ǫ'
O'odham	45,000		4	ñ ŋ ' ’ :	ḍ ḏ ṣ ĭ	
Omaha	60		2	’ ´ ñ áéíóú	ʰ ⁿ	
Oneida	200		2	áéíóú : : ' ’	ʌ	ʌ' line below
Old Norse	0		0	á ð é í ó ú ý þ æ ǽ œ ø ǫ		
Oroshor	3,000		0	č š ž ǧ ġ þ ẋ āēīōū		
OshiWambo	680,000	Y				
Ossetian	500,000		0	č š ž æ		
Otomi	240,000		4	' ’ ã ë ï ö ü ñ		ą̱ ę̱ ǫ̱ ṵ
Ottawa	7,400	Y				
Paakantyi	22	Y				
Paama	7,000		0	āēīōū		
Paicî	7,300		0	äâ éèëê î öô üùû		
Palauan	14,000		0	’ ę		
Pangasinan	1,500,000	Y				
Papiamento	330,000		0	’ ' acute grave		
Pawnee	100		0	’ ' acute grave		
Pennsylvania German	250,000		0	German		
Picard	700,000		0	å + French		
Piedmontese	3,000,000		0	ë ' ’ ‘ grave		
Pijin	300,000	Y				
Pinyin language (Cameroon)	27,000		5	ə ŋ ’ ' ẅ áéíóú āēīōū âêîôû ʉ ɨ	ǎěǐǒǔ	
Pipil	3,000	Y				
Pirahã	150		0	áéíóú ‘		

Pite Sámi	50		0	á đ ŧ ä å ø		
Pitjantjatjara	3,000		4		ḷ ṉ ṛ ṭ	
Pohnpeian	29,000	Y				
Polish	55,000,000		0	ą ć ę Ł ń ó ś ź ż		
Pomo (Eastern)	9		5	’ '		ạeịọu̱
Porja : NOT LATIN						
Portuguese	220,000,000		0	ãâáà éê í óôõ úü ç		
Potawatomi	100		0	é ' ’		
Purepecha	175,000		0	ï ’ '		
Q'anjob'al	80,000		1	áéíóú ’ '	ẍ	
Q'eqchi'	500,000	Y				
Quechua	8,000,000		0	ñ ' ’		
Rade	180,000		9	ă ê ô ơ ư č ñ	ĕ ĭ ŭ ŭ ƀ	ẽ õ ở ở
Raga	6,500		2		ḡ	n̄
Rapa Nui	2,700	Y				
Rarotongan	999		0	áéíóú		
Rennellese	4,400	Y				
Réunion Creole	560,000		0	é ëïÿ		
Ripuarian	900,000		0	äöü ß		
Rohingya	1,800,000		0	ç ñ		
Ronga	720,000		3	’ '	ṅ ŝ ẑ	
Rotokas	4,000	Y				
Romani	6,000,000		2	ä ć ç č Ďď dž ê ë ğ î Ľľ ň ö ŕ ř ś š Ťť ü ź ž ʒ	θ ǩ	
Romanian	24,000,000		0	ă â î ș ț		
Romániço	0		0	ç áéíóú		
Romansh	70,000		0	’ ' á à ä etc.		
Rotuman	9,000		1	’ ‘ ' å ä ö	ạ	
Roviana	25,000	Y				
Rushani	18,000		0	āēō č đ ğ ġ š þ ů ẋ ž		
Saami/Sámi : GENERIC NAME						
Saanich	20		9	Á Ć Í J Ś Ŧ	Ǽ Ȼ Ꝁ K̲ Ḱ Ł N̲ Ƿ T̲	W̲ X̲
Sakao	4,000		0	âêô íó		
Salar	60,000		0	öü ç ğ li ň ş		
Samoan	420,000		0	āēīōū ’ '		
Sanglechi	2,200		5	č đ ə ğ ġ š ẋ ž āēīōū	ḍ ḷ ṇ ṡ ṭ	
Sango	1,600,000		0	äëïöü âêîôû		
Saramaccan	25,000		0	ëö		
Sarcee	170		2	Ł ’ ‘ * áàā etc.	ạ ɣ	
Sardinian	1,200,000		0	ç ' ’ àá etc.		
Sarikoli	35,000		8	ɛ ʒ č š ž áéíóú	ы ǰ ɣ θ δ	x̌ ỷ ы'
Sarnámi Hindustani	250,000		3	~ à á â etc.	ḍ ṛ ṭ	
Sasak	2,100,000	Y				
Saterland Frisian	6,300		0	äöü á		
Satawalese	700	Y				

Scots	1,500,000		1		ʒ	
Scottish Gaelic	85,000		0	àèìòù áéíóú		
Sekani	30		5	à ą ę ị ǫ ò ụ ù ’ '	ą̀ ę̀ ị̀ ǫ̀ ụ̀	
Sena	1,600,000	Y				
Seneca	25		0	ãẽũ äëö ’ ' : ʔ áéíóú œ		
Seri	1,000		1	áéíó ö	ḷ ḷ	
Seychelles Creole	70,000	Y				
Shavante	10,000		0	ã â ä etc. ‘		
Shawnee	200	Y				
Shetland(ic)	999	Y				
Shilluk	175,000		0	ä ɛ ï ɔ ö ŋ ø ë		
Shona	9,000,000	Y				
Shoshone	3,000		2			ạ ị
Shughni	80,000		0	ā ē č đ ə ğ ġ ī ō š þ ů ẋ ž		
Sicilian	5,000,000		0	ç àèìòù		
Sierra Leonean Creole	4,500,000		0	ɛ ɔ ŋ àèìòù		
Silesian	1,250,000		0	ć č ń ř ś š ů ź ž		
Sioux	23,000		9	áéíóú ŋ ś ć č ġ š ž ’ '	ȟ ŋ ḣ ṗ ṫ ṭ	c̄ č ǧ k̄ ḱ p̄ š t̄
Skolt Sámi	400		2	â å ä č ʒ ʒ đ ǧ ŋ õ š ž	ǩ ǧ	
Slovak	5,600,000		0	á ä č ďĎ dz dž é í ÍĹ ľĽ ň ó ô ŕ š ťŤ ú ý ž		
Slovenian	2,500,000		0	č š ž ö ü ć đ ä ë ö ü áàâ etc.		
Slovio	0	Y				
Soga	2,200,000		0	ŋ		
Somali	17,000,000		0	’ ' áàâ etc.		
Soninke	2,100,000		0	ñ ŋ ’ '		
Sorbian	55,000		0	č ć ě łŁ ń ó ŕ ř ś š ź ž		
Southern Sámi	600		0	æ ø å ä ö ï		
Southern Pomo	1		1	č ’ ' š ʔ	ṭ	
Southern Sotho	5,000,000		0	š		
Spanish	570,000,000		0	áéíóú ñ ü ¡¿		
Sranan	400,000		0	è ò		
Stellingwarfs	999	Y				
Stoney	3,000		0	â î û ʔ		
Sumbawa	300,000	Y				
Sundanese	39,000,000		0	é		
Supyire	450,000		0	ɛ ŋ ɲ ɔ áàäã etc.		
Susu	1,100,000		0	ɛ ɲ ɔ		
Swahili	50,000,000	Y				
Swati/Swazi	1,500,000	Y				
Swedish	9,000,000		0	å ä ö		
Tagabawà	999		0	á é ó ’		

Tagalog	57,000,000	Y				
Tahitian	125,000		0	āēīōū ’		
Tarahumara	70,000		0	áàä etc. ’		
Tatar	7,000,000		0	ä ç ğ ıİ ñ ö ş ü ’		
Taiwanese	10,000,000		9	áàâā etc.	ă etc.	ȧ etc.
Talysh	1,000,000		0	ç ə ą ıİ ş		
Tamajaq = Tureg						
Tamasheq = Tureg						
Tariana	100		1	ãẽĩõ ñ : : ɨ	ʃ	
Tausūg	1,000,000		0	āēīōū ’		
Teleut : NOT LATIN						
Tepehuán	25,000		3	áéíóú ñ š ʔ : : ɨ	ʌ β	ɨ'
Ter Sámi	2		0	ā å č ē ī ŋ š ū č ʒ ǯ ’ ɨ		
Tetum	800,000		0	ñ		
Ticuna	41,000		3	č ñ ü ʔ áã etc.	ŭ	ũ a̰
Tii	20,000	Y				
Tikopia	3,300	Y				
Timbisha	99	Y				
Tiriyó	2,000		0	ë ï		
Tiwi	1,700	Y				
Tłı̨chǫ (Dogrib)	2,600		4	ąę̨ı̨ǫ ’ ' Ł àèìò		ą̀ę̀ı̨ǫ̀
Tlingit	400		2	áàâ éèê g̱ í ì î łŁ úùû ÿ ’ '	k̲	x̲
Toba Qom	40,000		0	č ñ š ỹ ’		
Tok Pisin	4,000,000	Y				
Tokelauan	5,000	Y				
Tongan	100,000		0	āēīōū ’		
Toposa	100,000		0	ŋ		
Toraja-Sa'dan	500,000		0	āēīōū ʔ		
Torres-Strait Creole	25,000		0	ò ù œ		
Tshiluba	6,000,000	Y				
Tsonga	3,600,000	Y				
Tsotsil	330,000		0	áéíóú ’		
Tswa	1,200,000		1	š ž	ṅ	
Tswana	4,400,000		0	ê ô š		
Tuareg	1,200,000		8	ă ɣ ğ ŋ š ž ʔ	ḍ əƎ ḥ ḷḷ ǰ ṣ ṭ ẓ	
Tucano	5,000		1	āēīū ñ ’ ' ʉ		ʉ̄
Tumbuka	2,000,000	Y				
Turkish	70,000,000		0	ç ğ ıİ ö ş ü âîû		
Turkmen	6,400,000		0	ç ä ž ň ö ş ü ý		
Turoyo	62,000		7	š ž	d̲ ḍ ḫḫ ṣ t̲ ṭ ĝ	
Tuscarora	9		2	ę : č ’ ' áéíú ʔ	θ	ę'
Tutchone	350		9	ą ä ę ị ụ ü łł ’ ' á à ā etc.	ą̈ ụ̈ ä̀ ä'ā̈ etc.	
Tuvaluan	10,000		0	āēīōū áàâ etc.		

Tuvan	200,000		3	ɵ ş ƶ	ɯ ṇ ь	
Twi	7,000,000		9	ą̈ ụ̈ ä̀ ä'ā̃ etc.	ă etc.	ȧ ė ṁ ṅ ŋ' ɛ̀ ɛ́ ɛ' ɔ'ɔ̀ ö'ü' ʉ'
Tzeltal	370,000	Y				
Udi	8,000		9	ă ə ç č ć ğ ıi̇ ö ś ş ü ŭ ź	ĉ ĕ ĭ ĵ ŏ ŝ ĸ ц ъ	
Umbundu	6,000,000		8	ãẽõũ áà etc.		ãẽõũ ãẽõũ'
Ume Sámi	10		0	á đ ï ŋ ŧ ú ä ö å		
Urarina	3,000		1		ʉ	
Uyghur	25,000,000		4	ə ë ɵ ü	ḳ ɯ ḥ ʒ	
Uzbek	16,000,000	Y				
Venda	1,200,000		5	ô	ḏ ḷ ṇ ṅ ṭ	
Venetian	2,000,000		3	č ċ ç đ ğ ġ ł Ł ž ż áàâ etc.	δ ṅ ṡ	
Veps	6,000		0	č š ž ä ö ü ʼ '		
Vietnamese	82,000,000		9	ă â đ ê ô ơ ư etc.	many	
Volapük	0		0	ä ö ü		
Võro	70,000		0	š ž õ ä ö ü ʼ '		
Wa	1,000,000		0	āēīōū		
Wakhi	31,000		9	č ə ɣ ž ʒ	ḍ δ ṭ ϑ ы	ḉ ǧ ǰ x̌ ẓ
Walloon	1,000,000		0	â å ç é è î ô û		
Wandamen	5,000	Y				
Warlpiri	3,000	Y				
Waray-Waray	3,000,000		0	ñ		
Wardaman	100	Y				
Wayuu	300,000		0	ñ ü ʼ '		
Welsh	700,000		2	áàâä etc. ŵ ẅ	ẁ ẃ	
Wemba Wemba	0	Y				
West Frisian= Frisian						
Western Rote	7,000	Y				
Wichita	0		0	áéíó ː ʔ		
Wik-Mungkan	1,000	Y				
Winnebago = Hotcąk						
Wiradjuri	1,000	Y				
Wolaytta	2,000,000		0	áéíóú 7 ʔ		
Wolof	7,000,000		0	à é ë ñ ŋ ó		
Wynadot	0		2	š ž ʔ		ɛ̃ ɔ̃
Xârâcùù	6,000		0	ä â é ë è ê î ö ô ü ù û		
Xhosa	8,000,000	Y				
Yabem	2,100		0	ê ŋ ô		
Yaghnobi	12,500		3	č ɣ ī ǰ š ū ž	ḥ ǰ	xᵒ
Yami	4,000	Y				
Yao	3,000,000		0	āēīōū ŵ		
Yapese	6,600		0	ä ë ö ʼ '		
Yaqui	16,000	Y				
Yemba	300,000		1	áéíóú ɛ ŋ ɔ ʼ ' ʉ		ʉ̄

Yindjibarndi	500	Y				
Yolngu	2,000		4	ä ŋ ’ '	d̲ l̲L̲ n̲ t̲	
Yoruba	22,000,000		7	áéíóú àèìòù	ẹ ọ ṣ	ẹ́ọ́ ẹ̀ọ̀
Yucatec Maya	1,000,000		0	áéíóú àèìòù		
Yuchi/Euchee	10		7	ɛ æ ə ɔ ĩ ẽ ã õ łŁ ’ ' @ ^	ʌ ʊ ʰ	ɛ̃ ɔ̃ æ̃ ə̃
Yucuna	6,000		0	ñ áéíóú ’ '		
Yurok	10	Y				
Záparo	100		0	č š ’ '		
Zapotec	500,000		0	ñ ’ ' : ë		
Zarma	2,200,000		0	ãẽĩõũ ŋ ɲ		
Zazaki	3,000,000		0	ç ê ğ î ş û		
Zhuang	10,000,000		8	ŋ ə	ɓ ɗ ɯ ɣ ʒ ɕ ʂ ɲ	
Zinza	140,000		0	áéíóú		
Zulu	9,000,000	Y				
Zuni	9,500		0	łŁ : ’ '		

Currency cross-reference

The next four topics contain a cross-reference of all world currency symbols that can be produced on the Q Keyboard, sorted as noted for ease in locating the desired key sequence.

See Currency symbols for more information.

This is not an exhaustive list of all known currencies in the world. The focus is on providing the information you need to type the more important notations. Some denominations that are obvious, such as simple dollar signs or dollar signs plus Latin letters or punctuation, are not included, to save space.

Other than the Riyal (Rial) symbol, currencies that require Arabic letters to represent are not supported. Note that the **Rial** symbol ﷼ is a **Right-to-Left** character.

In the tables that follow, entries with a **yellow background** have a key sequence other than ***AL [*** or ***AL]***. This is a reminder to **look more closely** at the keys you need to use.

When a **symbol** contains characters in blue background, they are ordinary QWERTY characters that are typed as-is. An example of this is the Cedi currency **GH₵**. The Unicode **U+** value you see is only for the part of the currency symbol that does not have a blue background. In the Cedi example, only the **₵** character is represented by the **U+** value and the key sequence shown.

Information about world currencies was found at:
https://en.wikipedia.org/wiki/Currency_symbol and other sources.

Some of this information may become inaccurate or out of date. Countries can and do occasionally revise their economic systems and adopt new currency symbols and representations. Should you find any errors in the currency tables in this document, please forward any corrections to the author. Your assistance will be appreciated.

By country

See Currency symbols for more information.

Currency symbols in Cyrillic, such as **ден**, are shown with their Latin transliteration below in parentheses, such as (DEN). Note that the **Rial** symbol ﷼ is a **Right-to-Left** character.

Country	Denomination	ISO	Sym	U+	Key Sequence
*	Bitcoin	BTC	฿	20BF	*AL [B*
*	Cent	-	¢	00A2	CL 2
*	Dogecoin	-	Ð	00D0	BU D
*	Ethereum	-	Ξ	039E	AU 4 J
*	Euro	EUR	€	20AC	*AL [E*
*	Euro	EUR	€	20AC	CL 4
*	Euro · is NBSP	EUR	· €	20AC	CU 4
*	Euro Currency	-	₠	20A0	*AL] E*
*	Franc	-	₣ Fr	20A3	*AL] F*
*	Generic	-	¤	00A4	AC Y AL 4 4
*	Mill	-	₥	20A5	*AL] M*
*	Rial	-	﷼	FDFC	*AL] R*
*	Rupees	-	₨	20A8	*AL [R*
*	Spesmilo	-	₧	20B7	*AL] X*
Afghan	Afghani	AFN	؋	060B	*AL] W*
Albanian	Lek	ALL	L		
Angolan	Kwanza	AOA	Kz		
Argentine	Austral	ARA	₳	20B3	*AL] A*
Armenian	Dram	AMD		058F	*AL [A*
Aruban	Florin	AWG Afl.	ƒ ƒ	0192	*AL [F* AC F
Azerbaijani	Manat	AZN	₼	20BC	*AL [M*
Belarusian	Ruble	BYN	Br		
Bengali	Rupee Mark	-	৲	09F2	*AL] *
Bengali	Rupee Taka	BDT	৳ Tk	09F3	*AL] B*
Bhutanese	Chhertum	BTN	Ch.		
Bhutanese	Ngultrum	BTN	Nu.		
Bolivian	Boliviano	BOB	Bs. Bs		
Bosnia and	Mark	BAM	KM		

Herzegovina					
Botswana	Pula	BWP	P		
Brazilian	Cruzeiro	BRB	₢ Cr$	20A2	*AL [X*
Brazilian	Real	BRL	R$		
British	Pound	GBP	£	00A3	CL 3
Bulgarian	Lev	BGN	лв. (LV.)	043B 0432 002E	AL W L AL W B .
Burundian	Franc	BIF	FBu		
Cambodian	Riel	KHR		17DB	*AL [Q*
Cape Verdean	Escudo	CVE	$ $ Esc		S AU \ \
Central African CFA	Franc	XAF	FCFA		
Chinese	Renminbi	CNY	元	5143	*AL] I*
Chinese	Yuán simplified	CNY	圆	5706	*AL] Y*
Chinese	Yuán traditional	CNY	圓	5713	*AL [Y*
Costa Rican	Colón	CRC	₡	20A1	*AL [C*
Croatian	Kuna	HRK	kn		
Croatian	Lipa	HRK	lp		
Czech	Haléř	-	h		
Czech	Koruna	CZK	Kč	010D	AL C
Danish	Krone	DKK	kr		
Egyptian	Piastre	EGP	Pt.		
Egyptian	Pound	EGP	L£	00A3	CL 3
Eritrean	Nakfa	ERN	Nkf		
Ethiopian	Birr	ETB	Br		
Faroese	Króna	FOK	kr		
French	Livre Tournois	-		20B6	*AL] H*
Gambian	Dalasi	GMD	D		
Georgian	Lari	GEL	₾	20BE	*AL] L*
German	Mark	DEM	ℳ DM	2133	*AU [M*
German	Penny	-	₰	20B0	*AL] G*
Ghana	Cedi	GHS	GH₵ GH¢	20B5 00A2	*AL] C* CL 2
Greek	Drachma	GRD	₯	20AF	*AL] D*
Guatemalan	Quetzal	GTQ	Q		
Gujarati	Rupee	-	ૐ	0AF1	*AL] Q*
Haitian	Gourde	HTG	G		
Honduran	Lempira	HNL	L		

Hungarian	Forint	HUF	Ft		
Icelandic	Króna	ISK	kr		
Indian	Rupee	INR	₹ ₹	20B9	*AL [I* AC I
Indonesian	Rupiah	IDR	Rp		
Israeli	Shekel	ILS	₪	20AA	*AL [S*
Italian	Lira	ITL	£	20A4	*AL [L*
Japanese	Yen	JPY	¥	00A5	CL 7
Japanese	Yuán Shinjitai	JPY	円	5186	*AL] J*
Jordanian	Dinar	JOD	JD		
Kannada	Rupee	-	ರೂ	0CB0	*AL [O*
Kazakhstani	Tenge	KZT	₸	20B8	*AL] T*
Kenyan	Shilling	KES	KSh		
Kyrgyzstani	Som	KGS	С̲ С̲		C AL - - BCU C
Lao	Kip	LAK	₭ ₭N	20AD	*AL [K*
Lebanese	Pound	LBP	LL		
Lesotho	Loti	LSL	M		
Macedonian	Denar	MKD	ден (DEN)	0434 0435 043D	AL W D AL W E AL W H
Malagasy	Ariary	MGA	Ar		
Malawian	Kwacha	MWK	MK		
Malaysian	Ringgit	MYR	RM		
Maldivian	Rufiyaa	MVR	Rf		
Mauritanian	Ouguiya	MRU	UM		
Mongolian	Tugrik	MNT	₮	20AE	*AL \ T*
Mozambican	Metical	MZN	MT		
Myanmar	Kyat	MMK	K		
Netherlands Antillean	Guilder	ANG	ƒ NAƒ	0192	*AL [F* AC F
Nicaraguan	Córdoba	NIO	C$		
Nigerian	Naira	NGN	₦	20A6	*AL [N*
Nordic	Mark	-		20BB	*AL] N*
North Indic	Rupee	-	ᒍ	A838	*AL [J*
North Korean	Won	KPW	₩ ₩	20A9	*AL [W* AC W
Norwegian	Krone	NOK	kr		
Panamanian	Balboa	PAB	B/.		
Papua New Guinean	Kina	PGK	K		
Paraguayan	Guaraní	PYG	₲	20B2	*AL [G*

Peruvian	Sol	PEN	S/		
Philippine	Peso	PHP	₱	20B1	*AL] P*
Polish	Grosz	PLN	gr		
Polish	Złoty	PLN	zł	0142	AL L
Russian	Ruble	RUB	₽ ₽	20BD	*AL [P* AC P
Rwandan	Franc	RWF	RF FRw RF	20A3	*AL] F*
Samoan	Tālā	WST	WS$		
São Tomé and Príncipe	Dobra	STN	Db		
Serbian	Dinar	RSD	дин (DIN)	0434 0438 043D	AL W D AL W N AL W H
Seychellois	Rupee	SCR	SR SRe		
Sierra Leonean	Leone	SLL	Le		
Sinhalese	Rupee	-	؋	0DD4	*AL] O*
Somali	Shilling	SOS	Sh.So.		
South African	Rand	ZAR	R		
South Korean	Won	KRW	₩ ₩	20A9	*AL [W* AC W
Spanish	Peseta	ESP	Pts	20A7	*AL \ P*
Swazi	Lilangeni	SZL	E		
Swedish	Krona	SEK	kr		
Syrian	Pound	SYP	£S LS	00A3	CL 3
Tamil	Rupee	-		0BF9	*AL] Z*
Tanzanian	Shilling	TZS	TSh		
Thai	Baht	THB	฿	0E3F	*AL / B*
Tongan	Pa'Anga	TOP	¢ T$	00A2	CL 2
Turkish	Lira	TRY	₺	20BA	*AL [T*
Ugandan	Shilling	UGX	USh		
Ukrainian	Hryvnia	UAH	₴	20B4	*AL [H*
Ukrainian	Hryvnia	UAH	грн (HRN)	0433 0440 043D	AL W 7 AL W P AL W H
Vanuatu	Vatu	VUV	VT		
Venezuelan	Bolívar	VEF	Bs. Bs.F.		
Vietnamese	Dong	VND	₫	20AB	*AL [D*

			đ		AC U
West African CFA	Franc	XOF	CFA		
Zambian	Kwacha	ZMW	ZK		

See Understanding modifier key notation for an explanation of modifier codes.

By denomination

See Currency symbols for more information.

Currency symbols in Cyrillic, such as **ден**, are shown with their Latin transliteration below in parentheses, such as (DEN). Note that the **Rial** symbol ﷼ is a **Right-to-Left** character.

Country	Denomination	ISO	Sym	U+	Key Sequence
Afghan	Afghani	AFN	؋	060B	*AL] W*
Malagasy	Ariary	MGA	Ar		
Argentine	Austral	ARA	₳	20B3	*AL] A*
Thai	Baht	THB	฿	0E3F	*AL / B*
Panamanian	Balboa	PAB	B/.		
Ethiopian	Birr	ETB	Br		
*	Bitcoin	BTC	฿	20BF	*AL [B*
Venezuelan	Bolívar	VEF	Bs. Bs.F.		
Bolivian	Boliviano	BOB	Bs. Bs		
Ghana	Cedi	GHS	GH₵ GH¢	20B5 00A2	*AL] C* CL 2
*	Cent	-	¢	00A2	CL 2
Bhutanese	Chhertum	BTN	Ch.		
Costa Rican	Colón	CRC	₡	20A1	*AL [C*
Nicaraguan	Córdoba	NIO	C$		
Brazilian	Cruzeiro	BRB	₢ Cr$	20A2	*AL [X*
Gambian	Dalasi	GMD	D		
Macedonian	Denar	MKD	ден (DEN)	0434 0435 043D	AL W D AL W E AL W H
Jordanian	Dinar	JOD	JD		
Serbian	Dinar	RSD	дин (DIN)	0434 0438 043D	AL W D AL W N AL W H
São Tomé and Príncipe	Dobra	STN	Db		
*	Dogecoin	-	Ð	00D0	BU D
Vietnamese	Dong	VND	₫ ₫	20AB	*AL [D* AC U
Greek	Drachma	GRD	₯	20AF	*AL] D*
Armenian	Dram	AMD		058F	*AL [A*

Cape Verdean	Escudo	CVE	$ $ Esc		S AU \ \
*	Ethereum	-	Ξ	039E	AU 4 J
*	Euro	EUR	€	20AC	*AL [E*
*	Euro	EUR	€	20AC	CL 4
*	Euro · is NBSP	EUR	· €	20AC	CU 4
*	Euro Currency	-	₠	20A0	*AL] E*
Aruban	Florin	AWG Afl.	ƒ ƒ	0192	*AL [F* AC F
Hungarian	Forint	HUF	Ft		
*	Franc	-	₣ Fr	20A3	*AL] F*
Burundian	Franc	BIF	FBu		
Central African CFA	Franc	XAF	FCFA		
Rwandan	Franc	RWF	R₣ FRw RF	20A3	*AL] F*
West African CFA	Franc	XOF	CFA		
*	Generic	-	¤	00A4	AC Y AL 4 4
Haitian	Gourde	HTG	G		
Polish	Grosz	PLN	gr		
Paraguayan	Guaraní	PYG	₲	20B2	*AL [G*
Netherlands Antillean	Guilder	ANG	ƒ NAƒ	0192	*AL [F* AC F
Czech	Haléř	-	h		
Ukrainian	Hryvnia	UAH	₴	20B4	*AL [H*
Ukrainian	Hryvnia	UAH	грн (HRN)	0433 0440 043D	AL W 7 AL W P AL W H
Papua New Guinean	Kina	PGK	K		
Lao	Kip	LAK	₭ ₭N	20AD	*AL [K*
Czech	Koruna	CZK	Kč	010D	AL C
Swedish	Krona	SEK	kr		
Faroese	Króna	FOK	kr		
Icelandic	Króna	ISK	kr		
Danish	Krone	DKK	kr		
Norwegian	Krone	NOK	kr		
Croatian	Kuna	HRK	kn		
Malawian	Kwacha	MWK	MK		

Zambian	Kwacha	ZMW	ZK		
Angolan	Kwanza	AOA	Kz		
Myanmar	Kyat	MMK	K		
Georgian	Lari	GEL	₾	20BE	*AL] L*
Albanian	Lek	ALL	L		
Honduran	Lempira	HNL	L		
Sierra Leonean	Leone	SLL	Le		
Bulgarian	Lev	BGN	лв. (LV.)	043B 0432 002E	AL W L AL W B .
Swazi	Lilangeni	SZL	E		
Croatian	Lipa	HRK	lp		
Italian	Lira	ITL	₤	20A4	*AL [L*
Turkish	Lira	TRY	₺	20BA	*AL [T*
French	Livre Tournois	-		20B6	*AL] H*
Lesotho	Loti	LSL	M		
Azerbaijani	Manat	AZN	₼	20BC	*AL [M*
Bosnia and Herzegovina	Mark	BAM	KM		
German	Mark	DEM	ℳ DM	2133	*AU [M*
Nordic	Mark	-		20BB	*AL] N*
Mozambican	Metical	MZN	MT		
*	Mill	-	₥	20A5	*AL] M*
Nigerian	Naira	NGN	₦	20A6	*AL [N*
Eritrean	Nakfa	ERN	Nkf		
Bhutanese	Ngultrum	BTN	Nu.		
Mauritanian	Ouguiya	MRU	UM		
Tongan	Pa'Anga	TOP	¢ T$	00A2	CL 2
German	Penny	-	₰	20B0	*AL] G*
Spanish	Peseta	ESP	Pts	20A7	*AL \ P*
Philippine	Peso	PHP	₱	20B1	*AL] P*
Egyptian	Piastre	EGP	Pt.		
British	Pound	GBP	£	00A3	CL 3
Egyptian	Pound	EGP	L£	00A3	CL 3
Lebanese	Pound	LBP	LL		
Syrian	Pound	SYP	£S LS	00A3	CL 3
Botswana	Pula	BWP	P		
Guatemalan	Quetzal	GTQ	Q		
South African	Rand	ZAR	R		
Brazilian	Real	BRL	R$		

Chinese	Renminbi	CNY	元	5143	AL] I
*	Rial	-	﷼	FDFC	AL] R
Cambodian	Riel	KHR		17DB	AL [Q
Malaysian	Ringgit	MYR	RM		
Belarusian	Ruble	BYN	Br		
Russian	Ruble	RUB	₽ ₽	20BD	AL [P AC P
Maldivian	Rufiyaa	MVR	Rf		
Gujarati	Rupee	-	ૐ	0AF1	AL] Q
Indian	Rupee	INR	₹ ₹	20B9	AL [I AC I
Kannada	Rupee	-	ರ	0CB0	AL [O
North Indic	Rupee	-	ᱰ	A838	AL [J
Seychellois	Rupee	SCR	SR SRe		
Sinhalese	Rupee	-	ල	0DD4	AL] O
Tamil	Rupee	-		0BF9	AL] Z
Bengali	Rupee Mark	-	৲	09F2	AL] \
Bengali	Rupee Taka	BDT	৳ Tk	09F3	AL] B
*	Rupees	-	Rs	20A8	AL [R
Indonesian	Rupiah	IDR	Rp		
Israeli	Shekel	ILS	₪	20AA	AL [S
Kenyan	Shilling	KES	KSh		
Somali	Shilling	SOS	Sh.So.		
Tanzanian	Shilling	TZS	TSh		
Ugandan	Shilling	UGX	USh		
Peruvian	Sol	PEN	S/		
Kyrgyzstani	Som	KGS	⅀ ⅀		C AL - - BCU C
*	Spesmilo	-	₧	20B7	AL] X
Samoan	Tālā	WST	WS$		
Kazakhstani	Tenge	KZT	₸	20B8	AL] T
Mongolian	Tugrik	MNT	₮	20AE	AL \ T
Vanuatu	Vatu	VUV	VT		
North Korean	Won	KPW	₩ ₩	20A9	AL [W AC W
South Korean	Won	KRW	₩ ₩	20A9	AL [W AC W
Japanese	Yen	JPY	¥	00A5	CL 7
Japanese	Yuán Shinjitai	JPY	円	5186	AL] J

Chinese	Yuán simplified	**CNY**	圆	**5706**	***AL] Y***
Chinese	Yuán traditional	**CNY**	圓	**5713**	***AL [Y***
Polish	Złoty	**PLN**	**zł**	**0142**	**AL L**

See Understanding modifier key notation for an explanation of modifier codes.

By ISO

See Currency symbols for more information.

Currency symbols in Cyrillic, such as **ден**, are shown with their Latin transliteration below in parentheses, such as (DEN). Note that the **Rial** symbol ﷼ is a **Right-to-Left** character.

Country	Denomination	ISO	Sym	U+	Key Sequence
*	Cent	-	¢	00A2	CL 2
*	Dogecoin	-	Ð	00D0	BU D
*	Ethereum	-	Ξ	039E	AU 4 J
*	Euro Currency	-	₠	20A0	*AL] E*
*	Franc	-	₣ Fr	20A3	*AL] F*
*	Generic	-	¤	00A4	AC Y AL 4 4
*	Mill	-	₥	20A5	*AL] M*
*	Rial	-	﷼	FDFC	*AL] R*
*	Rupees	-	₨	20A8	*AL [R*
*	Spesmilo	-	₧	20B7	*AL] X*
Bengali	Rupee Mark	-	৲	09F2	*AL] *
Czech	Haléř	-	h		
French	Livre Tournois	-		20B6	*AL] H*
German	Penny	-	₰	20B0	*AL] G*
Gujarati	Rupee	-	ૐ	0AF1	*AL] Q*
Kannada	Rupee	-	ರ	0CB0	*AL [O*
Nordic	Mark	-		20BB	*AL] N*
North Indic	Rupee	-	؋	A838	*AL [J*
Sinhalese	Rupee	-	؋	0DD4	*AL] O*
Tamil	Rupee	-		0BF9	*AL] Z*
Afghan	Afghani	AFN	؋	060B	*AL] W*
Albanian	Lek	ALL	L		
Armenian	Dram	AMD		058F	*AL [A*
Netherlands Antillean	Guilder	ANG	ƒ NAƒ	0192	*AL [F* AC F
Angolan	Kwanza	AOA	Kz		
Argentine	Austral	ARA	₳	20B3	*AL] A*
Aruban	Florin	AWG Afl.	ƒ ƒ	0192	*AL [F* AC F
Azerbaijani	Manat	AZN	₼	20BC	*AL [M*
Bosnia and	Mark	BAM	KM		

Herzegovina					
Bengali	Rupee Taka	BDT	৳ Tk	09F3	*AL] B*
Bulgarian	Lev	BGN	лв. (LV.)	043B 0432 002E	AL W L AL W B .
Burundian	Franc	BIF	FBu		
Bolivian	Boliviano	BOB	Bs. Bs		
Brazilian	Cruzeiro	BRB	₢ Cr$	20A2	*AL [X*
Brazilian	Real	BRL	R$		
*	Bitcoin	BTC	฿	20BF	*AL [B*
Bhutanese	Chhertum	BTN	Ch.		
Bhutanese	Ngultrum	BTN	Nu.		
Botswana	Pula	BWP	P		
Belarusian	Ruble	BYN	Br		
Chinese	Renminbi	CNY	元	5143	*AL] I*
Chinese	Yuán simplified	CNY	圆	5706	*AL] Y*
Chinese	Yuán traditional	CNY	圓	5713	*AL [Y*
Costa Rican	Colón	CRC	₡	20A1	*AL [C*
Cape Verdean	Escudo	CVE	$ $ Esc		S AU \ \
Czech	Koruna	CZK	Kč	010D	AL C
German	Mark	DEM	ℳ DM	2133	*AU [M*
Danish	Krone	DKK	kr		
Egyptian	Piastre	EGP	Pt.		
Egyptian	Pound	EGP	L£	00A3	CL 3
Eritrean	Nakfa	ERN	Nkf		
Spanish	Peseta	ESP	Pts	20A7	*AL \ P*
Ethiopian	Birr	ETB	Br		
*	Euro	EUR	€	20AC	*AL [E*
*	Euro	EUR	€	20AC	CL 4
*	Euro · is NBSP	EUR	· €	20AC	CU 4
Faroese	Króna	FOK	kr		
British	Pound	GBP	£	00A3	CL 3
Georgian	Lari	GEL	₾	20BE	*AL] L*
Ghana	Cedi	GHS	GH₵ GH¢	20B5 00A2	*AL] C* CL 2
Gambian	Dalasi	GMD	D		

Greek	Drachma	GRD	₯	20AF	AL] D
Guatemalan	Quetzal	GTQ	Q		
Honduran	Lempira	HNL	L		
Croatian	Kuna	HRK	kn		
Croatian	Lipa	HRK	lp		
Haitian	Gourde	HTG	G		
Hungarian	Forint	HUF	Ft		
Indonesian	Rupiah	IDR	Rp		
Israeli	Shekel	ILS	₪	20AA	AL [S
Indian	Rupee	INR	₹ ₹	20B9	AL [I AC I
Icelandic	Króna	ISK	kr		
Italian	Lira	ITL	₤	20A4	AL [L
Jordanian	Dinar	JOD	JD		
Japanese	Yen	JPY	¥	00A5	CL 7
Japanese	Yuán Shinjitai	JPY	円	5186	AL] J
Kenyan	Shilling	KES	KSh		
Kyrgyzstani	Som	KGS	C C		C AL - - BCU C
Cambodian	Riel	KHR		17DB	AL [Q
North Korean	Won	KPW	₩ ₩	20A9	AL [W AC W
South Korean	Won	KRW	₩ ₩	20A9	AL [W AC W
Kazakhstani	Tenge	KZT	₸	20B8	AL] T
Lao	Kip	LAK	₭ ₭N	20AD	AL [K
Lebanese	Pound	LBP	LL		
Lesotho	Loti	LSL	M		
Malagasy	Ariary	MGA	Ar		
Macedonian	Denar	MKD	ден (DEN)	0434 0435 043D	AL W D AL W E AL W H
Myanmar	Kyat	MMK	K		
Mongolian	Tugrik	MNT	₮	20AE	AL \ T
Mauritanian	Ouguiya	MRU	UM		
Maldivian	Rufiyaa	MVR	Rf		
Malawian	Kwacha	MWK	MK		
Malaysian	Ringgit	MYR	RM		
Mozambican	Metical	MZN	MT		
Nigerian	Naira	NGN	₦	20A6	AL [N
Nicaraguan	Córdoba	NIO	C$		

Norwegian	Krone	NOK	kr		
Panamanian	Balboa	PAB	B/.		
Peruvian	Sol	PEN	S/		
Papua New Guinean	Kina	PGK	K		
Philippine	Peso	PHP	₱	20B1	*AL] P*
Polish	Grosz	PLN	gr		
Polish	Złoty	PLN	zł	0142	AL L
Paraguayan	Guaraní	PYG	₲	20B2	*AL [G*
Serbian	Dinar	RSD	дин (DIN)	0434 0438 043D	AL W D AL W N AL W H
Russian	Ruble	RUB	₽ ₽	20BD	*AL [P* AC P
Rwandan	Franc	RWF	RF FRw RF	20A3	*AL] F*
Seychellois	Rupee	SCR	SR SRe		
Swedish	Krona	SEK	kr		
Sierra Leonean	Leone	SLL	Le		
Somali	Shilling	SOS	Sh.So.		
São Tomé and Príncipe	Dobra	STN	Db		
Syrian	Pound	SYP	£S LS	00A3	CL 3
Swazi	Lilangeni	SZL	E		
Thai	Baht	THB	฿	0E3F	*AL / B*
Tongan	Pa‘Anga	TOP	¢ T$	00A2	CL 2
Turkish	Lira	TRY	₺	20BA	*AL [T*
Tanzanian	Shilling	TZS	TSh		
Ukrainian	Hryvnia	UAH	₴	20B4	*AL [H*
Ukrainian	Hryvnia	UAH	грн (HRN)	0433 0440 043D	AL W 7 AL W P AL W H
Ugandan	Shilling	UGX	USh		
Venezuelan	Bolívar	VEF	Bs. Bs.F.		
Vietnamese	Dong	VND	₫ ₫	20AB	*AL [D* AC U
Vanuatu	Vatu	VUV	VT		
Samoan	Tālā	WST	WS$		
Central African CFA	Franc	XAF	FCFA		

West African CFA	Franc	**XOF**	**CFA**		
South African	Rand	**ZAR**	**R**		
Zambian	Kwacha	**ZMW**	**ZK**		

See Understanding modifier key notation for an explanation of modifier codes.

By Unicode

See Currency symbols for more information.

Currency symbols in Cyrillic, such as **ден**, are shown with their Latin transliteration below in parentheses, such as (DEN). Note that the **Rial** symbol ﷼ is a **Right-to-Left** character.

Country	Denomination	ISO	Sym	U+	Key Sequence
Albanian	Lek	ALL	L		
Angolan	Kwanza	AOA	Kz		
Belarusian	Ruble	BYN	Br		
Bhutanese	Chhertum	BTN	Ch.		
Bhutanese	Ngultrum	BTN	Nu.		
Bolivian	Boliviano	BOB	Bs. Bs		
Bosnia and Herzegovina	Mark	BAM	KM		
Botswana	Pula	BWP	P		
Brazilian	Real	BRL	R$		
Burundian	Franc	BIF	FBu		
Cape Verdean	Escudo	CVE	$ $ Esc		S AU \ \
Central African CFA	Franc	XAF	FCFA		
Croatian	Kuna	HRK	kn		
Croatian	Lipa	HRK	lp		
Czech	Haléř	-	h		
Danish	Krone	DKK	kr		
Egyptian	Piastre	EGP	Pt.		
Eritrean	Nakfa	ERN	Nkf		
Ethiopian	Birr	ETB	Br		
Faroese	Króna	FOK	kr		
Gambian	Dalasi	GMD	D		
Guatemalan	Quetzal	GTQ	Q		
Haitian	Gourde	HTG	G		
Honduran	Lempira	HNL	L		
Hungarian	Forint	HUF	Ft		
Icelandic	Króna	ISK	kr		
Indonesian	Rupiah	IDR	Rp		
Jordanian	Dinar	JOD	JD		
Kenyan	Shilling	KES	KSh		

Kyrgyzstani	Som	KGS	C Ç		C AL - - BCU C
Lebanese	Pound	LBP	LL		
Lesotho	Loti	LSL	M		
Malagasy	Ariary	MGA	Ar		
Malawian	Kwacha	MWK	MK		
Malaysian	Ringgit	MYR	RM		
Maldivian	Rufiyaa	MVR	Rf		
Mauritanian	Ouguiya	MRU	UM		
Mozambican	Metical	MZN	MT		
Myanmar	Kyat	MMK	K		
Nicaraguan	Córdoba	NIO	C$		
Norwegian	Krone	NOK	kr		
Panamanian	Balboa	PAB	B/.		
Papua New Guinean	Kina	PGK	K		
Peruvian	Sol	PEN	S/		
Polish	Grosz	PLN	gr		
Samoan	Tālā	WST	WS$		
São Tomé and Príncipe	Dobra	STN	Db		
Seychellois	Rupee	SCR	SR SRe		
Sierra Leonean	Leone	SLL	Le		
Somali	Shilling	SOS	Sh.So.		
South African	Rand	ZAR	R		
Swazi	Lilangeni	SZL	E		
Swedish	Krona	SEK	kr		
Tanzanian	Shilling	TZS	TSh		
Ugandan	Shilling	UGX	USh		
Vanuatu	Vatu	VUV	VT		
Venezuelan	Bolívar	VEF	Bs. Bs.F.		
West African CFA	Franc	XOF	CFA		
Zambian	Kwacha	ZMW	ZK		
*	Cent	-	¢	00A2	CL 2
Tongan	Pa‘Anga	TOP	¢ T$	00A2	CL 2
British	Pound	GBP	£	00A3	CL 3
Egyptian	Pound	EGP	L£	00A3	CL 3
Syrian	Pound	SYP	£S LS	00A3	CL 3
*	Generic	-	¤	00A4	AC Y

					AL 4 4
Japanese	Yen	JPY	¥	00A5	CL 7
*	Dogecoin	-	Ð	00D0	BU D
Czech	Koruna	CZK	Kč	010D	AL C
Polish	Złoty	PLN	zł	0142	AL L
Aruban	Florin	AWG Afl.	ƒ ƒ	0192	AL [F AC F
Netherlands Antillean	Guilder	ANG	ƒ NAƒ	0192	AL [F AC F
*	Ethereum	-	Ξ	039E	AU 4 J
Ukrainian	Hryvnia	UAH	грн (HRN)	0433 0440 043D	AL W 7 AL W P AL W H
Macedonian	Denar	MKD	ден (DEN)	0434 0435 043D	AL W D AL W E AL W H
Serbian	Dinar	RSD	дин (DIN)	0434 0438 043D	AL W D AL W N AL W H
Bulgarian	Lev	BGN	лв. (LV.)	043B 0432 002E	AL W L AL W B .
Armenian	Dram	AMD		058F	AL [A
Afghan	Afghani	AFN	؋	060B	AL] W
Bengali	Rupee Mark	-	৲	09F2	AL] \
Bengali	Rupee Taka	BDT	৳ Tk	09F3	AL] B
Gujarati	Rupee	-	ૐ	0AF1	AL] Q
Tamil	Rupee	-		0BF9	AL] Z
Kannada	Rupee	-	ರ	0CB0	AL [O
Sinhalese	Rupee	-	؋	0DD4	AL] O
Thai	Baht	THB	฿	0E3F	AL / B
Cambodian	Riel	KHR		17DB	AL [Q
*	Euro Currency	-	₠	20A0	AL] E
Costa Rican	Colón	CRC	₡	20A1	AL [C
Brazilian	Cruzeiro	BRB	₢ Cr$	20A2	AL [X
*	Franc	-	₣ Fr	20A3	AL] F
Rwandan	Franc	RWF	R₣ FRw RF	20A3	AL] F
Italian	Lira	ITL	₤	20A4	AL [L

*	Mill	-	₥	20A5	AL] M
Nigerian	Naira	NGN	₦	20A6	AL [N
Spanish	Peseta	ESP	₧	20A7	AL \ P
*	Rupees	-	₨	20A8	AL [R
North Korean	Won	KPW	₩ ₩	20A9	AL [W AC W
South Korean	Won	KRW	₩ ₩	20A9	AL [W AC W
Israeli	Shekel	ILS	₪	20AA	AL [S
Vietnamese	Dong	VND	₫ ₫	20AB	AL [D AC U
*	Euro	EUR	€	20AC	AL [E
*	Euro	EUR	€	20AC	CL 4
*	Euro · is NBSP	EUR	· €	20AC	CU 4
Lao	Kip	LAK	₭ ₭N	20AD	AL [K
Mongolian	Tugrik	MNT	₮	20AE	AL \ T
Greek	Drachma	GRD	₯	20AF	AL] D
German	Penny	-	₰	20B0	AL] G
Philippine	Peso	PHP	₱	20B1	AL] P
Paraguayan	Guaraní	PYG	₲	20B2	AL [G
Argentine	Austral	ARA	₳	20B3	AL] A
Ukrainian	Hryvnia	UAH	₴	20B4	AL [H
Ghana	Cedi	GHS	GH₵ GH¢	20B5 00A2	AL] C CL 2
French	Livre Tournois	-		20B6	AL] H
*	Spesmilo	-	₧	20B7	AL] X
Kazakhstani	Tenge	KZT	₸	20B8	AL] T
Indian	Rupee	INR	₹ ₹	20B9	AL [I AC I
Turkish	Lira	TRY	₺	20BA	AL [T
Nordic	Mark	-		20BB	AL] N
Azerbaijani	Manat	AZN	₼	20BC	AL [M
Russian	Ruble	RUB	₽ ₽	20BD	AL [P AC P
Georgian	Lari	GEL	₾	20BE	AL] L
*	Bitcoin	BTC	฿	20BF	AL [B
German	Mark	DEM	ℳ DM	2133	AU [M
Chinese	Renminbi	CNY	元	5143	AL] I
Japanese	Yuán Shinjitai	JPY	円	5186	AL] J
Chinese	Yuán simplified	CNY	圆	5706	AL] Y

Chinese	Yuán traditional	**CNY**	圓	**5713**	***AL [Y***
North Indic	Rupee	**-**	ل	**A838**	***AL [J***
*	Rial	**-**	﷼	**FDFC**	***AL] R***

See Understanding modifier key notation for an explanation of modifier codes.

Appendix: Complete character list

This Appendix shows every letter and symbol on the Q Keyboard, in order by by the Unicode value of each character, divided into major Unicode characters ranges that are available. There is also a complete list of all 77 digraphs and trigraphs available to you.

- In addition to scrolling through these lists, depending on the CHM or PDF reader in use, you may be able to use **Ctrl F** to request the **Help** facility to search for a symbol you need, such as **diaeresis**. The search feature is case-insensitive. You can also zoom the display by holding the **Ctrl** key and using the mouse wheel. That can help when you need a closer look at letters that have minor or subtle differences from each other. If the Q Keyboard software is enabled, remember to use the physical **Ctrl** key that ***not*** defined as the **CC** modifier when issuing **Ctrl F**. You may or may not be able to perform a global search of the entire Help document or for the entire Appendix. If you can't, you may have to reissue a search on each Appendix entry or Help article of interest. The search capabilities of CHM and PDF Help vary considerably, depending on which reader you use.

- The Appendix is divided into sections, so that no one section is overly large. If you are looking up a character by its code, that should not be a problem, but if you are trying to find something by its name, it may require several searches until you locate what you're looking for. If you need information on a character but don't know its Unicode value, the author recommends use of the **BabelMap** program, which can find characters using any portion of the name, such as "Circumflex". Once you find the complete name and its Unicode value, you can come back, select the Appendix entry with the appropriate **Range**, and determine the desired key sequence on the Q Keyboard.

  For information on **BabelMap**, see http://www.babelstone.co.uk/Software/BabelMap.html.
  Software is periodically updated, so be sure to check if you have the most current version. For software like BabelMap and BabelPad, updates will likely be available shortly after the Unicode Consortium makes a change to the Unicode standard, which happens about once a year.

- See Understanding modifier key notation for an explanation of modifier codes.

- Where a **Key Sequence** shows **SP** it represents the **Spacebar**.

- Where a **Key Sequence** shows **0** with a slash it is the digit zero ***key***, while the key for **Letter O** appears with no slash. Do not confuse this **key notation** with the unrelated Scandinavian letter **ø Ø**.

- Where a character Description contains the word **COMBINING**, you will see an accent

mark applied to a lower-case letter **o**. The letter **o** is present to help you **visualize** the accent, and is not part of the definition. In addition, not all combining accents render or format well when they appear by themselves "hanging in mid-air" unattached to a base letter, so the letter **o** serves a useful purpose.

Entries with a **yellow background** may not appear in the Help display, depending on your version of Windows, or may be characters that were added to Unicode very recently, and are present in very few fonts or possibly none at all as of this writing. After a symbol is added to Unicode, it can take one or more years before font vendors incorporate them.

A word of caution regarding characters in the Appendix

The fonts used to render the characters in the Appendix were chosen carefully, and were manually inspected to ensure they correctly represented the symbols in the table. However, in rare cases, fonts have been known to contain errors, occasionally resulting in completely incorrect glyphs being displayed. Also, some errors could have inadvertently gone unnoticed during inspection of the tables as they were being prepared, because the inspection is performed manually and the tables are very large.

In the following tables, the Unicode numeric values and their associated descriptions were taken directly from the Unicode Consortium. If you have any question about the identity of a character in the Appendix, **trust the description before the symbol**. You can also use a utility like **BabelMap** to compare the same symbol in many different fonts. Font errors tend to be random, so two fonts from two different vendors would generally never have the same error with the same character.

Though the Unicode Consortium does make its information publicly available, including the numeric code points and descriptions of each character appearing in the following Appendix and elsewhere, we wish to acknowledge its copyright on these materials.

Digraphs

Sym	Key Sequence	U+	Description
A̱	HYP BCU A	0041 0331	LATIN CAPITAL LETTER A COMBINING MACRON BELOW
B̄	HYP BCU B	0042 0304	LATIN CAPITAL LETTER B COMBINING MACRON
C’H	LIVE AC V	0043 2019 0048	LATIN CAPITAL LETTER C RIGHT SINGLE QUOTATION MARK LATIN CAPITAL LETTER H
C’h	LIVE BC V	0043 2019 0068	LATIN CAPITAL LETTER C RIGHT SINGLE QUOTATION MARK LATIN SMALL LETTER H
C̱	HYP BCU C	0043 0331	LATIN CAPITAL LETTER C COMBINING MACRON BELOW
D̄	HYP BCU D	0044 0304	LATIN CAPITAL LETTER D COMBINING MACRON
E̱	HYP BCU E	0045 0331	LATIN CAPITAL LETTER E COMBINING MACRON BELOW
F̄	HYP BCU F	0046 0304	LATIN CAPITAL LETTER F COMBINING MACRON
G̱	HYP BCU G	0047 0331	LATIN CAPITAL LETTER G COMBINING MACRON BELOW
H̱	HYP BCU H	0048 0331	LATIN CAPITAL LETTER H COMBINING MACRON BELOW
I̱	HYP BCU I	0049 0331	LATIN CAPITAL LETTER I COMBINING MACRON BELOW
J̌	LIVE AC J	004A 030C	LATIN CAPITAL LETTER J COMBINING CARON
J̄	HYP BCU J	004A 0304	LATIN CAPITAL LETTER J COMBINING MACRON
K̄	HYP BCU K	004B 0304	LATIN CAPITAL LETTER K COMBINING MACRON
L̄	HYP BCU L	004C 0304	LATIN CAPITAL LETTER L COMBINING MACRON
M̱	HYP BCU M	004D 0331	LATIN CAPITAL LETTER M COMBINING MACRON BELOW

N̈	HYP BCU ;	004E 0308	LATIN CAPITAL LETTER N COMBINING DIAERESIS
N̄	HYP BCU N	004E 0304	LATIN CAPITAL LETTER N COMBINING MACRON
Ọ	HYP BCU O	004F 0331	LATIN CAPITAL LETTER O COMBINING MACRON BELOW
P̄	HYP BCU P	0050 0304	LATIN CAPITAL LETTER P COMBINING MACRON
Q̄	HYP BCU Q	0051 0304	LATIN CAPITAL LETTER Q COMBINING MACRON
R̄	HYP BCU R	0052 0304	LATIN CAPITAL LETTER R COMBINING MACRON
Ṣ	HYP BCU S	0053 0331	LATIN CAPITAL LETTER S COMBINING MACRON BELOW
T̄	HYP BCU T	0054 0304	LATIN CAPITAL LETTER T COMBINING MACRON
Ụ	HYP BCU U	0055 0331	LATIN CAPITAL LETTER U COMBINING MACRON BELOW
Ṿ	HYP BCU V	0056 0331	LATIN CAPITAL LETTER V COMBINING MACRON BELOW
Ẉ	HYP BCU W	0057 0331	LATIN CAPITAL LETTER W COMBINING MACRON BELOW
Ẋ	HYP BCU X	0058 0331	LATIN CAPITAL LETTER X COMBINING MACRON BELOW
Ỵ	HYP BCU Y	0059 0331	LATIN CAPITAL LETTER Y COMBINING MACRON BELOW
Z̄	HYP BCU Z	005A 0304	LATIN CAPITAL LETTER Z COMBINING MACRON
ạ	HYP ABC A	0061 0331	LATIN SMALL LETTER A COMBINING MACRON BELOW
b̄	HYP ABC B	0062 0304	LATIN SMALL LETTER B COMBINING MACRON
c’h	LIVE AB V	0063 2019 0068	LATIN SMALL LETTER C RIGHT SINGLE QUOTATION MARK LATIN SMALL LETTER H
ḉ	HYP ABC C	0063 0331	LATIN SMALL LETTER C COMBINING MACRON BELOW
d̄	HYP ABC D	0064 0304	LATIN SMALL LETTER D COMBINING MACRON
ẹ	HYP ABC E	0065	LATIN SMALL LETTER E COMBINING MACRON BELOW

		0331	
f̄	HYP ABC F	0066 0304	LATIN SMALL LETTER F COMBINING MACRON
ḡ	HYP ABC G	0067 0304	LATIN SMALL LETTER G COMBINING MACRON
ẖ	HYP ABC H	0068 0331	LATIN SMALL LETTER H COMBINING MACRON BELOW
j̱	HYP ABC I	0069 0331	LATIN SMALL LETTER I COMBINING MACRON BELOW
j̄	HYP ABC J	006A 0304	LATIN SMALL LETTER J COMBINING MACRON
k̄	HYP ABC K	006B 0304	LATIN SMALL LETTER K COMBINING MACRON
l̄	HYP ABC L	006C 0304	LATIN SMALL LETTER L COMBINING MACRON
ṃ	HYP ABC M	006D 0331	LATIN SMALL LETTER M COMBINING MACRON BELOW
n̈	HYP ABC ;	006E 0308	LATIN SMALL LETTER N COMBINING DIAERESIS
n̄	HYP ABC N	006E 0304	LATIN SMALL LETTER N COMBINING MACRON
ọ	HYP ABC O	006F 0331	LATIN SMALL LETTER O COMBINING MACRON BELOW
p̄	HYP ABC P	0070 0304	LATIN SMALL LETTER P COMBINING MACRON
q̄	HYP ABC Q	0071 0304	LATIN SMALL LETTER Q COMBINING MACRON
r̄	HYP ABC R	0072 0304	LATIN SMALL LETTER R COMBINING MACRON
ṣ	HYP ABC S	0073 0331	LATIN SMALL LETTER S COMBINING MACRON BELOW
t̄	HYP ABC T	0074 0304	LATIN SMALL LETTER T COMBINING MACRON
ṵ	HYP ABC U	0075 0331	LATIN SMALL LETTER U COMBINING MACRON BELOW
v̱	HYP ABC V	0076 0331	LATIN SMALL LETTER V COMBINING MACRON BELOW
w̱	HYP ABC W	0077 0331	LATIN SMALL LETTER W COMBINING MACRON BELOW
x̱	HYP ABC X	0078	LATIN SMALL LETTER X

		0331	COMBINING MACRON BELOW
ȳ	HYP ABC Y	0079 0304	LATIN SMALL LETTER Y COMBINING MACRON
ȝ̄	HYP ABC Z	007A 0304	LATIN SMALL LETTER Z COMBINING MACRON
« ·	LIVE CU ,	00AB 00A0	LEFT-POINTING DOUBLE ANGLE QUOTATION MARK NO-BREAK SPACE (shown as dot)
« ·	LIVE AC ,	00AB 202F	LEFT-POINTING DOUBLE ANGLE QUOTATION MARK NARROW NO-BREAK SPACE (shown as dot)
· »	LIVE CU .	00A0 00BB	NO-BREAK SPACE (shown as dot) RIGHT-POINTING DOUBLE ANGLE QUOTATION MARK
· »	LIVE AC .	202F 00BB	NARROW NO-BREAK SPACE (shown as dot) RIGHT-POINTING DOUBLE ANGLE QUOTATION MARK
· €	LIVE CU 4	00A0 20AC	NO-BREAK SPACE (shown as dot) EURO SIGN
ɛ̃	HYP ABC `	025B 0303	LATIN SMALL LETTER OPEN E COMBINING TILDE
ɔ̃	HYP ABC 1	0254 0303	LATIN SMALL LETTER OPEN O COMBINING TILDE
ɛ̈	HYP ABC 9	025B 0308	LATIN SMALL LETTER OPEN E COMBINING DIAERESIS
ɔ̈	HYP ABC 0	0254 0308	LATIN SMALL LETTER OPEN O COMBINING DIAERESIS
Ɛ̃	HYP BCU `	0190 0303	LATIN CAPITAL LETTER OPEN COMBINING TILDE
Ɔ̃	HYP BCU 1	0186 0303	LATIN CAPITAL LETTER OPEN O COMBINING TILDE
Ɛ̈	HYP BCU 9	0190 0308	LATIN CAPITAL LETTER OPEN COMBINING DIAERESIS
Ɔ̈	HYP BCU 0	0186 0308	LATIN CAPITAL LETTER OPEN O COMBINING DIAERESIS
– ·	LIVE BC [	2013 00A0	EN DASH NO-BREAK SPACE (shown as dot)
— ·	LIVE BC]	2014 00A0	EM DASH NO-BREAK SPACE (shown as dot)
ȷ́	LIVE AB \	00ED 0237	LATIN SMALL LETTER I WITH ACUTE LATIN SMALL LETTER DOTLESS J
ȷ́	LIVE BC \	00CD 004A	LATIN CAPITAL LETTER I WITH ACUTE LATIN CAPITAL LETTER J
(ɔ)	HYP ABC '	0028	LEFT PARENTHESIS

		0254 0029	LATIN SMALL LETTER OPEN O RIGHT PARENTHESIS
???	HYP BCU =	*varies*	Q Keyboard ID string, depends on variant type

Range U+0000 to U+019F

U+	Sym	Key Sequence	Description
0048	H	DEAD AU = H	LATIN CAPITAL LETTER H - present for defective letters
004A	J	DEAD AU 2 J	LATIN CAPITAL LETTER J - present for defective letters
004A	J	DEAD AU] J	LATIN CAPITAL LETTER J - present for defective letters
0054	T	DEAD AU ; T	LATIN CAPITAL LETTER T - present for defective letters
00A0		DEAD AL / ;	NO-BREAK SPACE
00A0		DEAD AL X SP	NO-BREAK SPACE
00A0		DEAD AU X SP	NO-BREAK SPACE
00A0		*HELD AL / ;*	NO-BREAK SPACE
00A0		LIVE CL `	NO-BREAK SPACE
00A1	¡	LIVE CL 1	INVERTED EXCLAMATION MARK
00A2	¢	LIVE CL 2	CENT SIGN
00A3	£	LIVE CL 3	POUND SIGN
00A4	¤	DEAD AL 4 4	CURRENCY SIGN
00A4	¤	LIVE AC Y	CURRENCY SIGN
00A5	¥	LIVE CL 7	YEN SIGN
00A6	¦	LIVE CL \	BROKEN BAR
00A7	§	LIVE CL 8	SECTION SIGN
00A8	¨	DEAD AL ; SP	DIAERESIS
00A9	©	LIVE AC C	COPYRIGHT SIGN
00AA	ª	LIVE AC A	FEMININE ORDINAL INDICATOR
00AB	«	LIVE CL ,	LEFT-POINTING DOUBLE ANGLE QUOTATION MARK
00AC	¬	LIVE CL 6	NOT SIGN
00AD	-	DEAD AL - SP	SOFT HYPHEN
00AD	-	LIVE AB -	SOFT HYPHEN
00AE	®	LIVE AC X	REGISTERED SIGN
00AF	¯	DEAD AL = SP	MACRON
00B0	°	LIVE BL -	DEGREE SIGN
00B1	±	LIVE CL =	PLUS-MINUS SIGN
00B2	²	DEAD AL [2	SUPERSCRIPT TWO
00B2	²	*HELD AL [2*	SUPERSCRIPT TWO

00B2	²	LIVE CU 2	SUPERSCRIPT TWO
00B3	³	DEAD AL [3	SUPERSCRIPT THREE
00B3	³	*HELD AL [3*	SUPERSCRIPT THREE
00B3	³	LIVE CU 3	SUPERSCRIPT THREE
00B4	´	DEAD AL ' SP	ACUTE ACCENT
00B4	´	*HELD AL ' ;*	ACUTE ACCENT
00B4	´	LIVE AC `	ACUTE ACCENT
00B5	µ	DEAD AL M U	MICRO SIGN
00B5	µ	LIVE CL M	MICRO SIGN
00B6	¶	LIVE CL 9	PILCROW SIGN
00B7	·	LIVE CL -	MIDDLE DOT
00B8	¸	DEAD AL , SP	CEDILLA
00B9	¹	DEAD AL [1	SUPERSCRIPT ONE
00B9	¹	*HELD AL [1*	SUPERSCRIPT ONE
00B9	¹	LIVE CU 1	SUPERSCRIPT ONE
00BA	º	LIVE AC O	MASCULINE ORDINAL INDICATOR
00BB	»	LIVE CL .	RIGHT-POINTING DOUBLE ANGLE QUOTATION MARK
00BC	¼	*HELD AL 1 4*	VULGAR FRACTION ONE QUARTER
00BC	¼	LIVE AB 4	VULGAR FRACTION ONE QUARTER
00BD	½	*HELD AL 1 2*	VULGAR FRACTION ONE HALF
00BD	½	LIVE AB 2	VULGAR FRACTION ONE HALF
00BD	½	LIVE BC 2	VULGAR FRACTION ONE HALF
00BE	¾	*HELD AL 3 4*	VULGAR FRACTION THREE QUARTERS
00BE	¾	LIVE BC 4	VULGAR FRACTION THREE QUARTERS
00BF	¿	LIVE CL /	INVERTED QUESTION MARK
00C0	À	DEAD AU ` A	LATIN CAPITAL LETTER A WITH GRAVE
00C0	À	LIVE BU A	LATIN CAPITAL LETTER A WITH GRAVE
00C1	Á	DEAD AU ' A	LATIN CAPITAL LETTER A WITH ACUTE
00C1	Á	LIVE CU A	LATIN CAPITAL LETTER A WITH ACUTE
00C2	Â	DEAD AU 6 A	LATIN CAPITAL LETTER A WITH CIRCUMFLEX
00C2	Â	LIVE CU G	LATIN CAPITAL LETTER A WITH CIRCUMFLEX
00C3	Ã	DEAD AU 1 A	LATIN CAPITAL LETTER A WITH TILDE
00C3	Ã	LIVE BC A	LATIN CAPITAL LETTER A WITH TILDE
00C4	Ä	DEAD AU ; A	LATIN CAPITAL LETTER A WITH DIAERESIS

00C4	Ä	LIVE AU A	LATIN CAPITAL LETTER A WITH DIAERESIS
00C5	Å	DEAD AU 8 A	LATIN CAPITAL LETTER A WITH RING ABOVE
00C5	Å	LIVE BU Q	LATIN CAPITAL LETTER A WITH RING ABOVE
00C6	Æ	LIVE CU Q	LATIN CAPITAL LETTER AE
00C7	Ç	DEAD AU , C	LATIN CAPITAL LETTER C WITH CEDILLA
00C7	Ç	LIVE BU C	LATIN CAPITAL LETTER C WITH CEDILLA
00C8	È	DEAD AU ` E	LATIN CAPITAL LETTER E WITH GRAVE
00C8	È	LIVE BU E	LATIN CAPITAL LETTER E WITH GRAVE
00C9	É	DEAD AU ' E	LATIN CAPITAL LETTER E WITH ACUTE
00C9	É	LIVE CU E	LATIN CAPITAL LETTER E WITH ACUTE
00CA	Ê	DEAD AU 6 E	LATIN CAPITAL LETTER E WITH CIRCUMFLEX
00CA	Ê	LIVE CU F	LATIN CAPITAL LETTER E WITH CIRCUMFLEX
00CB	Ë	DEAD AU ; E	LATIN CAPITAL LETTER E WITH DIAERESIS
00CB	Ë	LIVE AU E	LATIN CAPITAL LETTER E WITH DIAERESIS
00CC	Ì	DEAD AU ` I	LATIN CAPITAL LETTER I WITH GRAVE
00CC	Ì	LIVE BU I	LATIN CAPITAL LETTER I WITH GRAVE
00CD	Í	DEAD AU ' I	LATIN CAPITAL LETTER I WITH ACUTE
00CD	Í	LIVE CU I	LATIN CAPITAL LETTER I WITH ACUTE
00CE	Î	DEAD AU 6 I	LATIN CAPITAL LETTER I WITH CIRCUMFLEX
00CE	Î	LIVE CU J	LATIN CAPITAL LETTER I WITH CIRCUMFLEX
00CF	Ï	DEAD AU ; I	LATIN CAPITAL LETTER I WITH DIAERESIS
00CF	Ï	LIVE AU I	LATIN CAPITAL LETTER I WITH DIAERESIS
00D0	Ð	LIVE BU D	LATIN CAPITAL LETTER ETH
00D1	Ñ	DEAD AU 1 N	LATIN CAPITAL LETTER N WITH TILDE
00D1	Ñ	LIVE CU N	LATIN CAPITAL LETTER N WITH TILDE
00D2	Ò	DEAD AU ` O	LATIN CAPITAL LETTER O WITH GRAVE
00D2	Ò	LIVE BU O	LATIN CAPITAL LETTER O WITH GRAVE
00D3	Ó	DEAD AU ' O	LATIN CAPITAL LETTER O WITH ACUTE
00D3	Ó	LIVE CU O	LATIN CAPITAL LETTER O WITH ACUTE
00D4	Ô	DEAD AU 6 O	LATIN CAPITAL LETTER O WITH CIRCUMFLEX
00D4	Ô	LIVE CU K	LATIN CAPITAL LETTER O WITH CIRCUMFLEX
00D5	Õ	DEAD AU 1 O	LATIN CAPITAL LETTER O WITH TILDE
00D5	Õ	LIVE BC O	LATIN CAPITAL LETTER O WITH TILDE
00D6	Ö	DEAD AU ; O	LATIN CAPITAL LETTER O WITH DIAERESIS

00D6	Ö	LIVE AU O	LATIN CAPITAL LETTER O WITH DIAERESIS
00D7	×	*HELD AL X X*	MULTIPLICATION SIGN
00D7	×	LIVE CU 8	MULTIPLICATION SIGN
00D8	Ø	DEAD AU / O	LATIN CAPITAL LETTER O WITH STROKE
00D8	Ø	LIVE CU 0	LATIN CAPITAL LETTER O WITH STROKE
00D9	Ù	DEAD AU ` U	LATIN CAPITAL LETTER U WITH GRAVE
00D9	Ù	LIVE BU U	LATIN CAPITAL LETTER U WITH GRAVE
00DA	Ú	DEAD AU ' U	LATIN CAPITAL LETTER U WITH ACUTE
00DA	Ú	LIVE CU U	LATIN CAPITAL LETTER U WITH ACUTE
00DB	Û	DEAD AU 6 U	LATIN CAPITAL LETTER U WITH CIRCUMFLEX
00DB	Û	LIVE CU H	LATIN CAPITAL LETTER U WITH CIRCUMFLEX
00DC	Ü	DEAD AU ; U	LATIN CAPITAL LETTER U WITH DIAERESIS
00DC	Ü	LIVE AU U	LATIN CAPITAL LETTER U WITH DIAERESIS
00DD	Ý	DEAD AU ' Y	LATIN CAPITAL LETTER Y WITH ACUTE
00DD	Ý	LIVE CU Y	LATIN CAPITAL LETTER Y WITH ACUTE
00DE	Þ	LIVE BC P	LATIN CAPITAL LETTER THORN
00DF	ß	LIVE AB S	LATIN SMALL LETTER SHARP S
00E0	à	DEAD AL ` A	LATIN SMALL LETTER A WITH GRAVE
00E0	à	LIVE BL A	LATIN SMALL LETTER A WITH GRAVE
00E1	á	DEAD AL ' A	LATIN SMALL LETTER A WITH ACUTE
00E1	á	LIVE CL A	LATIN SMALL LETTER A WITH ACUTE
00E2	â	DEAD AL 6 A	LATIN SMALL LETTER A WITH CIRCUMFLEX
00E2	â	LIVE CL G	LATIN SMALL LETTER A WITH CIRCUMFLEX
00E3	ã	DEAD AL 1 A	LATIN SMALL LETTER A WITH TILDE
00E3	ã	LIVE AB A	LATIN SMALL LETTER A WITH TILDE
00E4	ä	DEAD AL ; A	LATIN SMALL LETTER A WITH DIAERESIS
00E4	ä	LIVE AL A	LATIN SMALL LETTER A WITH DIAERESIS
00E5	å	DEAD AL 8 A	LATIN SMALL LETTER A WITH RING ABOVE
00E5	å	LIVE BL Q	LATIN SMALL LETTER A WITH RING ABOVE
00E6	æ	LIVE CL Q	LATIN SMALL LETTER AE
00E7	ç	DEAD AL , C	LATIN SMALL LETTER C WITH CEDILLA
00E7	ç	LIVE BL C	LATIN SMALL LETTER C WITH CEDILLA
00E8	è	DEAD AL ` E	LATIN SMALL LETTER E WITH GRAVE
00E8	è	LIVE BL E	LATIN SMALL LETTER E WITH GRAVE

00E9	é	DEAD AL ' E	LATIN SMALL LETTER E WITH ACUTE
00E9	é	LIVE CL E	LATIN SMALL LETTER E WITH ACUTE
00EA	ê	DEAD AL 6 E	LATIN SMALL LETTER E WITH CIRCUMFLEX
00EA	ê	LIVE CL F	LATIN SMALL LETTER E WITH CIRCUMFLEX
00EB	ë	DEAD AL ; E	LATIN SMALL LETTER E WITH DIAERESIS
00EB	ë	LIVE AL E	LATIN SMALL LETTER E WITH DIAERESIS
00EC	ì	DEAD AL ` I	LATIN SMALL LETTER I WITH GRAVE
00EC	ì	LIVE BL I	LATIN SMALL LETTER I WITH GRAVE
00ED	í	DEAD AL ' I	LATIN SMALL LETTER I WITH ACUTE
00ED	í	LIVE CL I	LATIN SMALL LETTER I WITH ACUTE
00EE	î	DEAD AL 6 I	LATIN SMALL LETTER I WITH CIRCUMFLEX
00EE	î	LIVE CL J	LATIN SMALL LETTER I WITH CIRCUMFLEX
00EF	ï	DEAD AL ; I	LATIN SMALL LETTER I WITH DIAERESIS
00EF	ï	LIVE AL I	LATIN SMALL LETTER I WITH DIAERESIS
00F0	ð	LIVE BL D	LATIN SMALL LETTER ETH
00F1	ñ	DEAD AL 1 N	LATIN SMALL LETTER N WITH TILDE
00F1	ñ	LIVE CL N	LATIN SMALL LETTER N WITH TILDE
00F2	ò	DEAD AL ` O	LATIN SMALL LETTER O WITH GRAVE
00F2	ò	LIVE BL O	LATIN SMALL LETTER O WITH GRAVE
00F3	ó	DEAD AL ' O	LATIN SMALL LETTER O WITH ACUTE
00F3	ó	LIVE CL O	LATIN SMALL LETTER O WITH ACUTE
00F4	ô	DEAD AL 6 O	LATIN SMALL LETTER O WITH CIRCUMFLEX
00F4	ô	LIVE CL K	LATIN SMALL LETTER O WITH CIRCUMFLEX
00F5	õ	DEAD AL 1 O	LATIN SMALL LETTER O WITH TILDE
00F5	õ	LIVE AB O	LATIN SMALL LETTER O WITH TILDE
00F6	ö	DEAD AL ; O	LATIN SMALL LETTER O WITH DIAERESIS
00F6	ö	LIVE AL O	LATIN SMALL LETTER O WITH DIAERESIS
00F7	÷	DEAD AL ; -	DIVISION SIGN
00F7	÷	*HELD AL X /*	DIVISION SIGN
00F7	÷	LIVE CU /	DIVISION SIGN
00F8	ø	DEAD AL / O	LATIN SMALL LETTER O WITH STROKE
00F8	ø	LIVE CL 0	LATIN SMALL LETTER O WITH STROKE
00F9	ù	DEAD AL ` U	LATIN SMALL LETTER U WITH GRAVE
00F9	ù	LIVE BL U	LATIN SMALL LETTER U WITH GRAVE

00FA	ú	DEAD AL ' U	LATIN SMALL LETTER U WITH ACUTE
00FA	ú	LIVE CL U	LATIN SMALL LETTER U WITH ACUTE
00FB	û	DEAD AL 6 U	LATIN SMALL LETTER U WITH CIRCUMFLEX
00FB	û	LIVE CL H	LATIN SMALL LETTER U WITH CIRCUMFLEX
00FC	ü	DEAD AL ; U	LATIN SMALL LETTER U WITH DIAERESIS
00FC	ü	LIVE AL U	LATIN SMALL LETTER U WITH DIAERESIS
00FD	ý	DEAD AL ' Y	LATIN SMALL LETTER Y WITH ACUTE
00FD	ý	LIVE CL Y	LATIN SMALL LETTER Y WITH ACUTE
00FE	þ	LIVE AB P	LATIN SMALL LETTER THORN
00FF	ÿ	DEAD AL ; Y	LATIN SMALL LETTER Y WITH DIAERESIS
00FF	ÿ	LIVE AL Y	LATIN SMALL LETTER Y WITH DIAERESIS
0100	Ā	DEAD AU = A	LATIN CAPITAL LETTER A WITH MACRON
0100	Ā	LIVE BU 1	LATIN CAPITAL LETTER A WITH MACRON
0101	ā	DEAD AL = A	LATIN SMALL LETTER A WITH MACRON
0101	ā	LIVE BL 1	LATIN SMALL LETTER A WITH MACRON
0102	Ă	DEAD AU 0 A	LATIN CAPITAL LETTER A WITH BREVE
0102	Ă	LIVE AU Q	LATIN CAPITAL LETTER A WITH BREVE
0103	ă	DEAD AL 0 A	LATIN SMALL LETTER A WITH BREVE
0103	ă	LIVE AL Q	LATIN SMALL LETTER A WITH BREVE
0104	Ą	DEAD AU 5 A	LATIN CAPITAL LETTER A WITH OGONEK
0104	Ą	LIVE BU G	LATIN CAPITAL LETTER A WITH OGONEK
0105	ą	DEAD AL 5 A	LATIN SMALL LETTER A WITH OGONEK
0105	ą	LIVE BL G	LATIN SMALL LETTER A WITH OGONEK
0106	Ć	DEAD AU ' C	LATIN CAPITAL LETTER C WITH ACUTE
0106	Ć	LIVE CU C	LATIN CAPITAL LETTER C WITH ACUTE
0107	ć	DEAD AL ' C	LATIN SMALL LETTER C WITH ACUTE
0107	ć	LIVE CL C	LATIN SMALL LETTER C WITH ACUTE
0108	Ĉ	DEAD AU 6 C	LATIN CAPITAL LETTER C WITH CIRCUMFLEX
0109	ĉ	DEAD AL 6 C	LATIN SMALL LETTER C WITH CIRCUMFLEX
010A	Ċ	DEAD AU . C	LATIN CAPITAL LETTER C WITH DOT ABOVE
010A	Ċ	LIVE BC C	LATIN CAPITAL LETTER C WITH DOT ABOVE
010B	ċ	DEAD AL . C	LATIN SMALL LETTER C WITH DOT ABOVE
010B	ċ	LIVE AB C	LATIN SMALL LETTER C WITH DOT ABOVE
010C	Č	DEAD AU] C	LATIN CAPITAL LETTER C WITH CARON

010C	Č	LIVE AU C	LATIN CAPITAL LETTER C WITH CARON
010D	č	DEAD AL] C	LATIN SMALL LETTER C WITH CARON
010D	č	LIVE AL C	LATIN SMALL LETTER C WITH CARON
010E	Ď	DEAD AU] D	LATIN CAPITAL LETTER D WITH CARON
010E	Ď	LIVE AU D	LATIN CAPITAL LETTER D WITH CARON
010F	ď	DEAD AL] D	LATIN SMALL LETTER D WITH CARON
010F	ď	LIVE AL D	LATIN SMALL LETTER D WITH CARON
0110	Đ	DEAD AU - D	LATIN CAPITAL LETTER D WITH STROKE
0110	Đ	LIVE CU D	LATIN CAPITAL LETTER D WITH STROKE
0111	đ	DEAD AL - D	LATIN SMALL LETTER D WITH STROKE
0111	đ	LIVE CL D	LATIN SMALL LETTER D WITH STROKE
0112	Ē	DEAD AU = E	LATIN CAPITAL LETTER E WITH MACRON
0112	Ē	LIVE BU 3	LATIN CAPITAL LETTER E WITH MACRON
0113	ē	DEAD AL = E	LATIN SMALL LETTER E WITH MACRON
0113	ē	LIVE BL 3	LATIN SMALL LETTER E WITH MACRON
0114	Ĕ	DEAD AU 0 E	LATIN CAPITAL LETTER E WITH BREVE
0115	ĕ	DEAD AL 0 E	LATIN SMALL LETTER E WITH BREVE
0116	Ė	DEAD AU . E	LATIN CAPITAL LETTER E WITH DOT ABOVE
0116	Ė	LIVE BU [	LATIN CAPITAL LETTER E WITH DOT ABOVE
0117	ė	DEAD AL . E	LATIN SMALL LETTER E WITH DOT ABOVE
0117	ė	LIVE BL [	LATIN SMALL LETTER E WITH DOT ABOVE
0118	Ę	DEAD AU 5 E	LATIN CAPITAL LETTER E WITH OGONEK
0118	Ę	LIVE BU F	LATIN CAPITAL LETTER E WITH OGONEK
0119	ę	DEAD AL 5 E	LATIN SMALL LETTER E WITH OGONEK
0119	ę	LIVE BL F	LATIN SMALL LETTER E WITH OGONEK
011A	Ě	DEAD AU] E	LATIN CAPITAL LETTER E WITH CARON
011A	Ě	LIVE AU F	LATIN CAPITAL LETTER E WITH CARON
011B	ě	DEAD AL] E	LATIN SMALL LETTER E WITH CARON
011B	ě	LIVE AL F	LATIN SMALL LETTER E WITH CARON
011C	Ĝ	DEAD AU 6 G	LATIN CAPITAL LETTER G WITH CIRCUMFLEX
011D	ĝ	DEAD AL 6 G	LATIN SMALL LETTER G WITH CIRCUMFLEX
011E	Ğ	DEAD AU 0 G	LATIN CAPITAL LETTER G WITH BREVE
011E	Ğ	LIVE AU G	LATIN CAPITAL LETTER G WITH BREVE
011F	ğ	DEAD AL 0 G	LATIN SMALL LETTER G WITH BREVE

011F	ğ	LIVE AL G	LATIN SMALL LETTER G WITH BREVE
0120	Ġ	DEAD AU . G	LATIN CAPITAL LETTER G WITH DOT ABOVE
0120	Ġ	LIVE BU \	LATIN CAPITAL LETTER G WITH DOT ABOVE
0121	ġ	DEAD AL . G	LATIN SMALL LETTER G WITH DOT ABOVE
0121	ġ	LIVE BL \	LATIN SMALL LETTER G WITH DOT ABOVE
0122	Ģ	DEAD AU , G	LATIN CAPITAL LETTER G WITH CEDILLA
0122	Ģ	LIVE BC G	LATIN CAPITAL LETTER G WITH CEDILLA
0123	ģ	DEAD AL , G	LATIN SMALL LETTER G WITH CEDILLA
0123	ģ	LIVE AB G	LATIN SMALL LETTER G WITH CEDILLA
0124	Ĥ	DEAD AU 6 H	LATIN CAPITAL LETTER H WITH CIRCUMFLEX
0125	ĥ	DEAD AL 6 H	LATIN SMALL LETTER H WITH CIRCUMFLEX
0126	Ħ	DEAD AU - H	LATIN CAPITAL LETTER H WITH STROKE
0126	Ħ	LIVE BC H	LATIN CAPITAL LETTER H WITH STROKE
0127	ħ	DEAD AL - H	LATIN SMALL LETTER H WITH STROKE
0127	ħ	LIVE AB H	LATIN SMALL LETTER H WITH STROKE
0128	Ĩ	DEAD AU 1 I	LATIN CAPITAL LETTER I WITH TILDE
0128	Ĩ	LIVE BC I	LATIN CAPITAL LETTER I WITH TILDE
0129	ĩ	DEAD AL 1 I	LATIN SMALL LETTER I WITH TILDE
0129	ĩ	LIVE AB I	LATIN SMALL LETTER I WITH TILDE
012A	Ī	DEAD AU = I	LATIN CAPITAL LETTER I WITH MACRON
012A	Ī	LIVE BU 8	LATIN CAPITAL LETTER I WITH MACRON
012B	ī	DEAD AL = I	LATIN SMALL LETTER I WITH MACRON
012B	ī	LIVE BL 8	LATIN SMALL LETTER I WITH MACRON
012C	Ĭ	DEAD AU 0 I	LATIN CAPITAL LETTER I WITH BREVE
012D	ĭ	DEAD AL 0 I	LATIN SMALL LETTER I WITH BREVE
012E	Į	DEAD AU 5 I	LATIN CAPITAL LETTER I WITH OGONEK
012E	Į	LIVE BU J	LATIN CAPITAL LETTER I WITH OGONEK
012F	į	DEAD AL 5 I	LATIN SMALL LETTER I WITH OGONEK
012F	į	LIVE BL J	LATIN SMALL LETTER I WITH OGONEK
0130	İ	DEAD AU . I	LATIN CAPITAL LETTER I WITH DOT ABOVE
0130	İ	LIVE AU J	LATIN CAPITAL LETTER I WITH DOT ABOVE
0131	ı	DEAD AL . I	LATIN SMALL LETTER DOTLESS I
0131	ı	LIVE AL J	LATIN SMALL LETTER DOTLESS I
0132	IJ	LIVE BC J	LATIN CAPITAL LIGATURE IJ

0133	ij	LIVE AB J	LATIN SMALL LIGATURE IJ
0134	Ĵ	DEAD AU 6 J	LATIN CAPITAL LETTER J WITH CIRCUMFLEX
0135	ĵ	DEAD AL 6 J	LATIN SMALL LETTER J WITH CIRCUMFLEX
0136	Ķ	DEAD AU , K	LATIN CAPITAL LETTER K WITH CEDILLA
0136	Ķ	LIVE BC K	LATIN CAPITAL LETTER K WITH CEDILLA
0137	ķ	DEAD AL , K	LATIN SMALL LETTER K WITH CEDILLA
0137	ķ	LIVE AB K	LATIN SMALL LETTER K WITH CEDILLA
0138	ĸ	LIVE AC K	LATIN SMALL LETTER KRA
0139	Ĺ	DEAD AU ' L	LATIN CAPITAL LETTER L WITH ACUTE
0139	Ĺ	LIVE CU L	LATIN CAPITAL LETTER L WITH ACUTE
013A	ĺ	DEAD AL ' L	LATIN SMALL LETTER L WITH ACUTE
013A	ĺ	LIVE CL L	LATIN SMALL LETTER L WITH ACUTE
013B	Ļ	DEAD AU , L	LATIN CAPITAL LETTER L WITH CEDILLA
013B	Ļ	LIVE BU L	LATIN CAPITAL LETTER L WITH CEDILLA
013C	ļ	DEAD AL , L	LATIN SMALL LETTER L WITH CEDILLA
013C	ļ	LIVE BL L	LATIN SMALL LETTER L WITH CEDILLA
013D	Ľ	DEAD AU] L	LATIN CAPITAL LETTER L WITH CARON
013D	Ľ	LIVE BU '	LATIN CAPITAL LETTER L WITH CARON
013E	ľ	DEAD AL] L	LATIN SMALL LETTER L WITH CARON
013E	ľ	LIVE BL '	LATIN SMALL LETTER L WITH CARON
013F	Ŀ	DEAD AU . L	LATIN CAPITAL LETTER L WITH MIDDLE DOT
013F	Ŀ	LIVE BU ;	LATIN CAPITAL LETTER L WITH MIDDLE DOT
0140	ŀ	DEAD AL . L	LATIN SMALL LETTER L WITH MIDDLE DOT
0140	ŀ	LIVE BL ;	LATIN SMALL LETTER L WITH MIDDLE DOT
0141	Ł	DEAD AU / L	LATIN CAPITAL LETTER L WITH STROKE
0141	Ł	LIVE AU L	LATIN CAPITAL LETTER L WITH STROKE
0142	ł	DEAD AL / L	LATIN SMALL LETTER L WITH STROKE
0142	ł	LIVE AL L	LATIN SMALL LETTER L WITH STROKE
0143	Ń	DEAD AU ' N	LATIN CAPITAL LETTER N WITH ACUTE
0143	Ń	LIVE CU B	LATIN CAPITAL LETTER N WITH ACUTE
0144	ń	DEAD AL ' N	LATIN SMALL LETTER N WITH ACUTE
0144	ń	LIVE CL B	LATIN SMALL LETTER N WITH ACUTE
0145	Ņ	DEAD AU , N	LATIN CAPITAL LETTER N WITH CEDILLA
0145	Ņ	LIVE BU N	LATIN CAPITAL LETTER N WITH CEDILLA

0146	ņ	DEAD AL , N	LATIN SMALL LETTER N WITH CEDILLA
0146	ņ	LIVE BL N	LATIN SMALL LETTER N WITH CEDILLA
0147	Ň	DEAD AU] N	LATIN CAPITAL LETTER N WITH CARON
0147	Ň	LIVE AU N	LATIN CAPITAL LETTER N WITH CARON
0148	ň	DEAD AL] N	LATIN SMALL LETTER N WITH CARON
0148	ň	LIVE AL N	LATIN SMALL LETTER N WITH CARON
0149	ʼn	*HELD AL ' N*	LATIN SMALL LETTER N PRECEDED BY APOSTROPHE
0149	ʼn	*HELD AL , N*	LATIN SMALL LETTER N PRECEDED BY APOSTROPHE
014A	Ŋ	LIVE BU B	LATIN CAPITAL LETTER ENG
014B	ŋ	LIVE BL B	LATIN SMALL LETTER ENG
014C	Ō	DEAD AU = O	LATIN CAPITAL LETTER O WITH MACRON
014C	Ō	LIVE BU 9	LATIN CAPITAL LETTER O WITH MACRON
014D	ō	DEAD AL = O	LATIN SMALL LETTER O WITH MACRON
014D	ō	LIVE BL 9	LATIN SMALL LETTER O WITH MACRON
014E	Ŏ	DEAD AU 0 O	LATIN CAPITAL LETTER O WITH BREVE
014F	ŏ	DEAD AL 0 O	LATIN SMALL LETTER O WITH BREVE
0150	Ő	DEAD AU 3 O	LATIN CAPITAL LETTER O WITH DOUBLE ACUTE
0150	Ő	LIVE AU K	LATIN CAPITAL LETTER O WITH DOUBLE ACUTE
0151	ő	DEAD AL 3 O	LATIN SMALL LETTER O WITH DOUBLE ACUTE
0151	ő	LIVE AL K	LATIN SMALL LETTER O WITH DOUBLE ACUTE
0152	Œ	LIVE CU P	LATIN CAPITAL LIGATURE OE
0153	œ	LIVE CL P	LATIN SMALL LIGATURE OE
0154	Ŕ	DEAD AU ' R	LATIN CAPITAL LETTER R WITH ACUTE
0154	Ŕ	LIVE CU R	LATIN CAPITAL LETTER R WITH ACUTE
0155	ŕ	DEAD AL ' R	LATIN SMALL LETTER R WITH ACUTE
0155	ŕ	LIVE CL R	LATIN SMALL LETTER R WITH ACUTE
0156	Ŗ	DEAD AU , R	LATIN CAPITAL LETTER R WITH CEDILLA
0156	Ŗ	LIVE BU R	LATIN CAPITAL LETTER R WITH CEDILLA
0157	ŗ	DEAD AL , R	LATIN SMALL LETTER R WITH CEDILLA
0157	ŗ	LIVE BL R	LATIN SMALL LETTER R WITH CEDILLA
0158	Ř	DEAD AU] R	LATIN CAPITAL LETTER R WITH CARON
0158	Ř	LIVE AU R	LATIN CAPITAL LETTER R WITH CARON
0159	ř	DEAD AL] R	LATIN SMALL LETTER R WITH CARON
0159	ř	LIVE AL R	LATIN SMALL LETTER R WITH CARON

015A	Ś	DEAD AU ' S	LATIN CAPITAL LETTER S WITH ACUTE
015A	Ś	LIVE CU S	LATIN CAPITAL LETTER S WITH ACUTE
015B	ś	DEAD AL ' S	LATIN SMALL LETTER S WITH ACUTE
015B	ś	LIVE CL S	LATIN SMALL LETTER S WITH ACUTE
015C	Ŝ	DEAD AU 6 S	LATIN CAPITAL LETTER S WITH CIRCUMFLEX
015D	ŝ	DEAD AL 6 S	LATIN SMALL LETTER S WITH CIRCUMFLEX
015E	Ş	DEAD AU , S	LATIN CAPITAL LETTER S WITH CEDILLA
015E	Ş	LIVE BU X	LATIN CAPITAL LETTER S WITH CEDILLA
015F	ş	DEAD AL , S	LATIN SMALL LETTER S WITH CEDILLA
015F	ş	LIVE BL X	LATIN SMALL LETTER S WITH CEDILLA
0160	Š	DEAD AU] S	LATIN CAPITAL LETTER S WITH CARON
0160	Š	LIVE AU S	LATIN CAPITAL LETTER S WITH CARON
0161	š	DEAD AL] S	LATIN SMALL LETTER S WITH CARON
0161	š	LIVE AL S	LATIN SMALL LETTER S WITH CARON
0162	Ţ	DEAD AU , T	LATIN CAPITAL LETTER T WITH CEDILLA
0162	Ţ	LIVE BC T	LATIN CAPITAL LETTER T WITH CEDILLA
0163	ţ	DEAD AL , T	LATIN SMALL LETTER T WITH CEDILLA
0163	ţ	LIVE AB T	LATIN SMALL LETTER T WITH CEDILLA
0164	Ť	DEAD AU] T	LATIN CAPITAL LETTER T WITH CARON
0164	Ť	LIVE AU T	LATIN CAPITAL LETTER T WITH CARON
0165	ť	DEAD AL] T	LATIN SMALL LETTER T WITH CARON
0165	ť	LIVE AL T	LATIN SMALL LETTER T WITH CARON
0166	Ŧ	DEAD AU - T	LATIN CAPITAL LETTER T WITH STROKE
0166	Ŧ	LIVE CU T	LATIN CAPITAL LETTER T WITH STROKE
0167	ŧ	DEAD AL - T	LATIN SMALL LETTER T WITH STROKE
0167	ŧ	LIVE CL T	LATIN SMALL LETTER T WITH STROKE
0168	Ũ	DEAD AU 1 U	LATIN CAPITAL LETTER U WITH TILDE
0168	Ũ	LIVE BC U	LATIN CAPITAL LETTER U WITH TILDE
0169	ũ	DEAD AL 1 U	LATIN SMALL LETTER U WITH TILDE
0169	ũ	LIVE AB U	LATIN SMALL LETTER U WITH TILDE
016A	Ū	DEAD AU = U	LATIN CAPITAL LETTER U WITH MACRON
016A	Ū	LIVE BU 7	LATIN CAPITAL LETTER U WITH MACRON
016B	ū	DEAD AL = U	LATIN SMALL LETTER U WITH MACRON
016B	ū	LIVE BL 7	LATIN SMALL LETTER U WITH MACRON

016C	Ŭ	DEAD AU 0 U	LATIN CAPITAL LETTER U WITH BREVE
016C	Ŭ	LIVE AU P	LATIN CAPITAL LETTER U WITH BREVE
016D	ŭ	DEAD AL 0 U	LATIN SMALL LETTER U WITH BREVE
016D	ŭ	LIVE AL P	LATIN SMALL LETTER U WITH BREVE
016E	Ů	DEAD AU 8 U	LATIN CAPITAL LETTER U WITH RING ABOVE
016E	Ů	LIVE BU P	LATIN CAPITAL LETTER U WITH RING ABOVE
016F	ů	DEAD AL 8 U	LATIN SMALL LETTER U WITH RING ABOVE
016F	ů	LIVE BL P	LATIN SMALL LETTER U WITH RING ABOVE
0170	Ű	DEAD AU 3 U	LATIN CAPITAL LETTER U WITH DOUBLE ACUTE
0170	Ű	LIVE AU H	LATIN CAPITAL LETTER U WITH DOUBLE ACUTE
0171	ű	DEAD AL 3 U	LATIN SMALL LETTER U WITH DOUBLE ACUTE
0171	ű	LIVE AL H	LATIN SMALL LETTER U WITH DOUBLE ACUTE
0172	Ų	DEAD AU 5 U	LATIN CAPITAL LETTER U WITH OGONEK
0172	Ų	LIVE BU H	LATIN CAPITAL LETTER U WITH OGONEK
0173	ų	DEAD AL 5 U	LATIN SMALL LETTER U WITH OGONEK
0173	ų	LIVE BL H	LATIN SMALL LETTER U WITH OGONEK
0174	Ŵ	DEAD AU 6 W	LATIN CAPITAL LETTER W WITH CIRCUMFLEX
0174	Ŵ	DEAD AU [W	LATIN CAPITAL LETTER W WITH CIRCUMFLEX
0174	Ŵ	LIVE BC W	LATIN CAPITAL LETTER W WITH CIRCUMFLEX
0175	ŵ	DEAD AL 6 W	LATIN SMALL LETTER W WITH CIRCUMFLEX
0175	ŵ	DEAD AL [W	LATIN SMALL LETTER W WITH CIRCUMFLEX
0175	ŵ	LIVE AB W	LATIN SMALL LETTER W WITH CIRCUMFLEX
0176	Ŷ	DEAD AU 6 Y	LATIN CAPITAL LETTER Y WITH CIRCUMFLEX
0176	Ŷ	LIVE CU V	LATIN CAPITAL LETTER Y WITH CIRCUMFLEX
0177	ŷ	DEAD AL 6 Y	LATIN SMALL LETTER Y WITH CIRCUMFLEX
0177	ŷ	LIVE CL V	LATIN SMALL LETTER Y WITH CIRCUMFLEX
0178	Ÿ	DEAD AU ; Y	LATIN CAPITAL LETTER Y WITH DIAERESIS
0178	Ÿ	LIVE AU Y	LATIN CAPITAL LETTER Y WITH DIAERESIS
0179	Ź	DEAD AU ' Z	LATIN CAPITAL LETTER Z WITH ACUTE
0179	Ź	LIVE CU Z	LATIN CAPITAL LETTER Z WITH ACUTE
017A	ź	DEAD AL ' Z	LATIN SMALL LETTER Z WITH ACUTE
017A	ź	LIVE CL Z	LATIN SMALL LETTER Z WITH ACUTE
017B	Ż	DEAD AU . Z	LATIN CAPITAL LETTER Z WITH DOT ABOVE
017B	Ż	LIVE BU Z	LATIN CAPITAL LETTER Z WITH DOT ABOVE

017C	ż	DEAD AL . Z	LATIN SMALL LETTER Z WITH DOT ABOVE
017C	ż	LIVE BL Z	LATIN SMALL LETTER Z WITH DOT ABOVE
017D	Ž	DEAD AU] Z	LATIN CAPITAL LETTER Z WITH CARON
017D	Ž	LIVE AU Z	LATIN CAPITAL LETTER Z WITH CARON
017E	ž	DEAD AL] Z	LATIN SMALL LETTER Z WITH CARON
017E	ž	LIVE AL Z	LATIN SMALL LETTER Z WITH CARON
017F	ſ	LIVE AC S	LATIN SMALL LETTER LONG S
0180	ƀ	DEAD AL - B	LATIN SMALL LETTER B WITH STROKE
0181	Ɓ	DEAD AU X B	LATIN CAPITAL LETTER B WITH HOOK
0181	Ɓ	LIVE BC ;	LATIN CAPITAL LETTER B WITH HOOK
0182	Б	DEAD AU 1 B	LATIN CAPITAL LETTER B WITH TOPBAR
0183	б	DEAD AL 1 B	LATIN SMALL LETTER B WITH TOPBAR
0184	Ƅ	DEAD AU X 6	LATIN CAPITAL LETTER TONE SIX
0185	ƅ	DEAD AL X 6	LATIN SMALL LETTER TONE SIX
0186	Ɔ	DEAD AU X O	LATIN CAPITAL LETTER OPEN O
0186	Ɔ	LIVE BU V	LATIN CAPITAL LETTER OPEN O
0187	Ƈ	DEAD AU X C	LATIN CAPITAL LETTER C WITH HOOK
0188	ƈ	DEAD AL X C	LATIN SMALL LETTER C WITH HOOK
0189	Ɖ	DEAD AU M D	LATIN CAPITAL LETTER AFRICAN D
018A	Ɗ	DEAD AU X D	LATIN CAPITAL LETTER D WITH HOOK
018A	Ɗ	LIVE BC '	LATIN CAPITAL LETTER D WITH HOOK
018B	ƋƋ	DEAD AU 1 D	LATIN CAPITAL LETTER D WITH TOPBAR
018C	ƌ	DEAD AL 1 D	LATIN SMALL LETTER D WITH TOPBAR
018D	ƍ	DEAD AL 4 9	LATIN SMALL LETTER TURNED DELTA
018E	Ǝ	DEAD AU M E	LATIN CAPITAL LETTER REVERSED E
018F	Ə	DEAD AU X X	LATIN CAPITAL LETTER SCHWA
018F	Ə	LIVE BU `	LATIN CAPITAL LETTER SCHWA
0190	Ɛ	DEAD AU X E	LATIN CAPITAL LETTER OPEN E
0190	Ɛ	LIVE BU 2	LATIN CAPITAL LETTER OPEN E
0191	Ƒ	DEAD AU X F	LATIN CAPITAL LETTER F WITH HOOK
0192	ƒ	DEAD AL X F	LATIN SMALL LETTER F WITH HOOK
0192	ƒ	*HELD AL [F*	LATIN SMALL LETTER F WITH HOOK
0192	ƒ	LIVE AC F	LATIN SMALL LETTER F WITH HOOK
0193	Ɠ	DEAD AU X G	LATIN CAPITAL LETTER G WITH HOOK

0194	Ɣ	LIVE CU X	LATIN CAPITAL LETTER GAMMA
0195	ƕ	DEAD AL M W	LATIN SMALL LETTER HV
0196	Ɩ	DEAD AU X I	LATIN CAPITAL LETTER IOTA
0197	Ɨ	DEAD AU - I	LATIN CAPITAL LETTER I WITH STROKE
0197	Ɨ	DEAD AU M I	LATIN CAPITAL LETTER I WITH STROKE
0197	Ɨ	LIVE BC `	LATIN CAPITAL LETTER I WITH STROKE
0198	Ƙ	DEAD AU X K	LATIN CAPITAL LETTER K WITH HOOK
0199	ƙ	DEAD AL X K	LATIN SMALL LETTER K WITH HOOK
019A	ƚ	DEAD AL - L	LATIN SMALL LETTER L WITH BAR
019A	ƚ	*HELD AL ; L*	LATIN SMALL LETTER L WITH BAR
019B	ƛ	*HELD AL 4 L*	LATIN SMALL LETTER LAMBDA WITH STROKE
019C	Ɯ	DEAD AU M M	LATIN CAPITAL LETTER TURNED M
019D	Ɲ	DEAD AU X N	LATIN CAPITAL LETTER N WITH LEFT HOOK
019D	Ɲ	LIVE BC B	LATIN CAPITAL LETTER N WITH LEFT HOOK
019E	ƞ	DEAD AL M N	LATIN SMALL LETTER N WITH LONG RIGHT LEG
019F	Ɵ	DEAD AU - O	LATIN CAPITAL LETTER O WITH MIDDLE TILDE
019F	Ɵ	DEAD AU 2 O	LATIN CAPITAL LETTER O WITH MIDDLE TILDE
019F	Ɵ	LIVE BC 0	LATIN CAPITAL LETTER O WITH MIDDLE TILDE

Range U+01A0 to U+02FF

U+	Sym	Key Sequence	Description
01A0	Ơ	DEAD AU , O	LATIN CAPITAL LETTER O WITH HORN
01A0	Ơ	LIVE AU B	LATIN CAPITAL LETTER O WITH HORN
01A1	ơ	DEAD AL , O	LATIN SMALL LETTER O WITH HORN
01A1	ơ	LIVE AL B	LATIN SMALL LETTER O WITH HORN
01A2	Ƣ	DEAD AU 6 9	LATIN CAPITAL LETTER OI
01A3	ƣ	DEAD AL 6 9	LATIN SMALL LETTER OI
01A4	Ƥ	DEAD AU X P	LATIN CAPITAL LETTER P WITH HOOK
01A5	ƥ	DEAD AL X P	LATIN SMALL LETTER P WITH HOOK
01A6	Ʀ	*HELD AL 3 R*	LATIN LETTER YR
01A7	Ƨ	DEAD AU X 2	LATIN CAPITAL LETTER TONE TWO
01A8	ƨ	DEAD AL X 2	LATIN SMALL LETTER TONE TWO
01A9	Σ	DEAD AU X S	LATIN CAPITAL LETTER ESH
01AA	ƪ	DEAD AL 0 Z	LATIN LETTER REVERSED ESH LOOP
01AB	ƫ	*HELD AL 0 T*	LATIN SMALL LETTER T WITH PALATAL HOOK
01AC	Ƭ	DEAD AU X T	LATIN CAPITAL LETTER T WITH HOOK
01AD	ƭ	DEAD AL X T	LATIN SMALL LETTER T WITH HOOK
01AE	Ʈ	*HELD AU 7 T*	LATIN CAPITAL LETTER T WITH RETROFLEX HOOK
01AF	Ư	DEAD AU , U	LATIN CAPITAL LETTER U WITH HORN
01AF	Ư	LIVE AU V	LATIN CAPITAL LETTER U WITH HORN
01B0	ư	DEAD AL , U	LATIN SMALL LETTER U WITH HORN
01B0	ư	LIVE AL V	LATIN SMALL LETTER U WITH HORN
01B1	Ʊ	DEAD AU X U	LATIN CAPITAL LETTER UPSILON
01B2	Ʋ	DEAD AU X V	LATIN CAPITAL LETTER V WITH HOOK
01B3	Ʒ	DEAD AU X Y	LATIN CAPITAL LETTER Y WITH HOOK
01B4	ʒ	DEAD AL X Y	LATIN SMALL LETTER Y WITH HOOK
01B5	Ƶ	DEAD AU - Z	LATIN CAPITAL LETTER Z WITH STROKE
01B5	Ƶ	LIVE BC Z	LATIN CAPITAL LETTER Z WITH STROKE
01B6	ƶ	DEAD AL - Z	LATIN SMALL LETTER Z WITH STROKE
01B6	ƶ	LIVE AB Z	LATIN SMALL LETTER Z WITH STROKE
01B7	Ʒ	LIVE BU 4	LATIN CAPITAL LETTER EZH
01B8	Ƹ	DEAD AU X Z	LATIN CAPITAL LETTER EZH REVERSED

01B9	ƹ	DEAD AL X Z	LATIN SMALL LETTER EZH REVERSED
01BA	ʒ	DEAD AL M Z	LATIN SMALL LETTER EZH WITH TAIL
01BB	ƻ	DEAD AL - 2	LATIN LETTER TWO WITH STROKE
01BC	Ƽ	DEAD AU X 5	LATIN CAPITAL LETTER TONE FIVE
01BD	ƽ	DEAD AL X 5	LATIN SMALL LETTER TONE FIVE
01BE	ƾ	*HELD AL 9 5*	LATIN LETTER INVERTED GLOTTAL STOP WITH STROKE
01BF	ƿ	DEAD AL 8 P	LATIN LETTER WYNN
01C0	ǀ	DEAD AL X \	LATIN LETTER DENTAL CLICK
01C1	ǁ	DEAD AL X /	LATIN LETTER LATERAL CLICK
01C2	ǂ	DEAD AL X =	LATIN LETTER ALVEOLAR CLICK
01C3	!	DEAD AL X 1	LATIN LETTER RETROFLEX CLICK
01C4	DŽ	LIVE AC D	LATIN CAPITAL LETTER DZ WITH CARON
01C5	Dž	LIVE BC D	LATIN CAPITAL LETTER D WITH SMALL LETTER Z WITH CARON
01C6	dž	LIVE AB D	LATIN SMALL LETTER DZ WITH CARON
01C7	LJ	LIVE AC L	LATIN CAPITAL LETTER LJ
01C8	Lj	LIVE BC L	LATIN CAPITAL LETTER L WITH SMALL LETTER J
01C9	lj	LIVE AB L	LATIN SMALL LETTER LJ
01CA	NJ	LIVE AC N	LATIN CAPITAL LETTER NJ
01CB	Nj	LIVE BC N	LATIN CAPITAL LETTER N WITH SMALL LETTER J
01CC	nj	LIVE AB N	LATIN SMALL LETTER NJ
01CD	Ǎ	DEAD AU] A	LATIN CAPITAL LETTER A WITH CARON
01CE	ǎ	DEAD AL] A	LATIN SMALL LETTER A WITH CARON
01CF	Ǐ	DEAD AU] I	LATIN CAPITAL LETTER I WITH CARON
01D0	ǐ	DEAD AL] I	LATIN SMALL LETTER I WITH CARON
01D1	Ǒ	DEAD AU] O	LATIN CAPITAL LETTER O WITH CARON
01D2	ǒ	DEAD AL] O	LATIN SMALL LETTER O WITH CARON
01D3	Ǔ	DEAD AU] U	LATIN CAPITAL LETTER U WITH CARON
01D4	ǔ	DEAD AL] U	LATIN SMALL LETTER U WITH CARON
01D5	Ǖ	*HELD AU ; =*	LATIN CAPITAL LETTER U WITH DIAERESIS AND MACRON
01D5	Ǖ	*HELD AU = U*	LATIN CAPITAL LETTER U WITH DIAERESIS AND MACRON
01D6	ǖ	*HELD AL ; =*	LATIN SMALL LETTER U WITH DIAERESIS AND MACRON
01D6	ǖ	*HELD AL = U*	LATIN SMALL LETTER U WITH DIAERESIS AND MACRON
01D7	Ǘ	*HELD AU ' U*	LATIN CAPITAL LETTER U WITH DIAERESIS AND ACUTE
01D7	Ǘ	*HELD AU ; '*	LATIN CAPITAL LETTER U WITH DIAERESIS AND ACUTE

01D8	ǘ	*HELD AL ' U*	LATIN SMALL LETTER U WITH DIAERESIS AND ACUTE
01D8	ǘ	*HELD AL ; '*	LATIN SMALL LETTER U WITH DIAERESIS AND ACUTE
01D9	Ǔ	*HELD AU ;]*	LATIN CAPITAL LETTER U WITH DIAERESIS AND CARON
01D9	Ǔ	*HELD AU] U*	LATIN CAPITAL LETTER U WITH DIAERESIS AND CARON
01DA	ǔ	*HELD AL ;]*	LATIN SMALL LETTER U WITH DIAERESIS AND CARON
01DA	ǔ	*HELD AL] U*	LATIN SMALL LETTER U WITH DIAERESIS AND CARON
01DB	Ǜ	*HELD AU ; [*	LATIN CAPITAL LETTER U WITH DIAERESIS AND GRAVE
01DB	Ǜ	*HELD AU ; `*	LATIN CAPITAL LETTER U WITH DIAERESIS AND GRAVE
01DB	Ǜ	*HELD AU ` U*	LATIN CAPITAL LETTER U WITH DIAERESIS AND GRAVE
01DC	ǜ	*HELD AL ; [*	LATIN SMALL LETTER U WITH DIAERESIS AND GRAVE
01DC	ǜ	*HELD AL ; `*	LATIN SMALL LETTER U WITH DIAERESIS AND GRAVE
01DC	ǜ	*HELD AL ` U*	LATIN SMALL LETTER U WITH DIAERESIS AND GRAVE
01DD	ə	DEAD AL M E	LATIN SMALL LETTER TURNED E
01DE	Ǎ̄	*HELD AU ; A*	LATIN CAPITAL LETTER A WITH DIAERESIS AND MACRON
01DF	ǎ̄	*HELD AL ; A*	LATIN SMALL LETTER A WITH DIAERESIS AND MACRON
01E0	Ǡ	*HELD AU . A*	LATIN CAPITAL LETTER A WITH DOT ABOVE AND MACRON
01E1	ǡ	*HELD AL . A*	LATIN SMALL LETTER A WITH DOT ABOVE AND MACRON
01E2	Ǣ	DEAD AU = Q	LATIN CAPITAL LETTER AE WITH MACRON
01E3	ǣ	DEAD AL = Q	LATIN SMALL LETTER AE WITH MACRON
01E4	Ꞡ	DEAD AU - G	LATIN CAPITAL LETTER G WITH STROKE
01E4	Ꞡ	DEAD AU 5 G	LATIN CAPITAL LETTER G WITH STROKE
01E5	ꞡ	DEAD AL - G	LATIN SMALL LETTER G WITH STROKE
01E5	ꞡ	DEAD AL 5 G	LATIN SMALL LETTER G WITH STROKE
01E6	Ǧ	DEAD AU 2 G	LATIN CAPITAL LETTER G WITH CARON
01E6	Ǧ	DEAD AU] G	LATIN CAPITAL LETTER G WITH CARON
01E6	Ǧ	LIVE BU]	LATIN CAPITAL LETTER G WITH CARON
01E7	ǧ	DEAD AL 2 G	LATIN SMALL LETTER G WITH CARON
01E7	ǧ	DEAD AL] G	LATIN SMALL LETTER G WITH CARON
01E7	ǧ	LIVE BL]	LATIN SMALL LETTER G WITH CARON
01E8	Ǩ	DEAD AU 2 K	LATIN CAPITAL LETTER K WITH CARON
01E8	Ǩ	DEAD AU] K	LATIN CAPITAL LETTER K WITH CARON
01E9	ǩ	DEAD AL 2 K	LATIN SMALL LETTER K WITH CARON
01E9	ǩ	DEAD AL] K	LATIN SMALL LETTER K WITH CARON
01EA	Ǫ	DEAD AU 5 O	LATIN CAPITAL LETTER O WITH OGONEK

01EA	Ǫ	LIVE BU K	LATIN CAPITAL LETTER O WITH OGONEK
01EB	ǫ	DEAD AL 5 O	LATIN SMALL LETTER O WITH OGONEK
01EB	ǫ	LIVE BL K	LATIN SMALL LETTER O WITH OGONEK
01EC	Ǭ	*HELD AU 5 O*	LATIN CAPITAL LETTER O WITH OGONEK AND MACRON
01ED	ǭ	*HELD AL 5 O*	LATIN SMALL LETTER O WITH OGONEK AND MACRON
01EE	Ǯ	LIVE BU 5	LATIN CAPITAL LETTER EZH WITH CARON
01EF	ǯ	LIVE BL 5	LATIN SMALL LETTER EZH WITH CARON
01F0	ǰ	DEAD AL 2 J	LATIN SMALL LETTER J WITH CARON
01F0	ǰ	DEAD AL] J	LATIN SMALL LETTER J WITH CARON
01F1	DZ	LIVE AC R	LATIN CAPITAL LETTER DZ
01F2	Dz	LIVE BC R	LATIN CAPITAL LETTER D WITH SMALL LETTER Z
01F3	dz	LIVE AB R	LATIN SMALL LETTER DZ
01F4	Ǵ	DEAD AU ' G	LATIN CAPITAL LETTER G WITH ACUTE
01F4	Ǵ	DEAD AU 7 G	LATIN CAPITAL LETTER G WITH ACUTE
01F5	ǵ	DEAD AL ' G	LATIN SMALL LETTER G WITH ACUTE
01F5	ǵ	DEAD AL 7 G	LATIN SMALL LETTER G WITH ACUTE
01F6	Ƕ	DEAD AU M W	LATIN CAPITAL LETTER HWAIR
01F7	Ƿ	DEAD AU 8 P	LATIN CAPITAL LETTER WYNN
01F8	Ǹ	DEAD AU ` N	LATIN CAPITAL LETTER N WITH GRAVE
01F9	ǹ	DEAD AL ` N	LATIN SMALL LETTER N WITH GRAVE
01FA	Ǻ	*HELD AU ' A*	LATIN CAPITAL LETTER A WITH RING ABOVE AND ACUTE
01FA	Ǻ	LIVE BU W	LATIN CAPITAL LETTER A WITH RING ABOVE AND ACUTE
01FB	ǻ	*HELD AL ' A*	LATIN SMALL LETTER A WITH RING ABOVE AND ACUTE
01FB	ǻ	LIVE BL W	LATIN SMALL LETTER A WITH RING ABOVE AND ACUTE
01FC	Ǽ	DEAD AU ' Q	LATIN CAPITAL LETTER AE WITH ACUTE
01FC	Ǽ	LIVE CU W	LATIN CAPITAL LETTER AE WITH ACUTE
01FD	ǽ	DEAD AL ' Q	LATIN SMALL LETTER AE WITH ACUTE
01FD	ǽ	LIVE CL W	LATIN SMALL LETTER AE WITH ACUTE
01FE	Ǿ	*HELD AU / O*	LATIN CAPITAL LETTER O WITH STROKE AND ACUTE
01FE	Ǿ	LIVE BU 0	LATIN CAPITAL LETTER O WITH STROKE AND ACUTE
01FF	ǿ	*HELD AL / O*	LATIN SMALL LETTER O WITH STROKE AND ACUTE
01FF	ǿ	LIVE BL 0	LATIN SMALL LETTER O WITH STROKE AND ACUTE
0200	Ȁ	DEAD AU 3 A	LATIN CAPITAL LETTER A WITH DOUBLE GRAVE
0201	ȁ	DEAD AL 3 A	LATIN SMALL LETTER A WITH DOUBLE GRAVE

0202	Ȃ	DEAD AU 9 A	LATIN CAPITAL LETTER A WITH INVERTED BREVE
0203	ȃ	DEAD AL 9 A	LATIN SMALL LETTER A WITH INVERTED BREVE
0204	Ȅ	DEAD AU 3 E	LATIN CAPITAL LETTER E WITH DOUBLE GRAVE
0205	ȅ	DEAD AL 3 E	LATIN SMALL LETTER E WITH DOUBLE GRAVE
0206	Ȇ	DEAD AU 9 E	LATIN CAPITAL LETTER E WITH INVERTED BREVE
0207	ȇ	DEAD AL 9 E	LATIN SMALL LETTER E WITH INVERTED BREVE
0208	Ȉ	DEAD AU 3 I	LATIN CAPITAL LETTER I WITH DOUBLE GRAVE
0209	ȉ	DEAD AL 3 I	LATIN SMALL LETTER I WITH DOUBLE GRAVE
020A	Ȋ	DEAD AU 9 I	LATIN CAPITAL LETTER I WITH INVERTED BREVE
020B	ȋ	DEAD AL 9 I	LATIN SMALL LETTER I WITH INVERTED BREVE
020C	Ȍ	*HELD AU 3 O*	LATIN CAPITAL LETTER O WITH DOUBLE GRAVE
020D	ȍ	*HELD AL 3 O*	LATIN SMALL LETTER O WITH DOUBLE GRAVE
020E	Ȏ	DEAD AU 9 O	LATIN CAPITAL LETTER O WITH INVERTED BREVE
020F	ȏ	DEAD AL 9 O	LATIN SMALL LETTER O WITH INVERTED BREVE
0210	Ȑ	DEAD AU 3 R	LATIN CAPITAL LETTER R WITH DOUBLE GRAVE
0211	ȑ	DEAD AL 3 R	LATIN SMALL LETTER R WITH DOUBLE GRAVE
0212	Ȓ	DEAD AU 9 R	LATIN CAPITAL LETTER R WITH INVERTED BREVE
0213	ȓ	DEAD AL 9 R	LATIN SMALL LETTER R WITH INVERTED BREVE
0214	Ȕ	*HELD AU 3 U*	LATIN CAPITAL LETTER U WITH DOUBLE GRAVE
0215	ȕ	*HELD AL 3 U*	LATIN SMALL LETTER U WITH DOUBLE GRAVE
0216	Ȗ	DEAD AU 9 U	LATIN CAPITAL LETTER U WITH INVERTED BREVE
0217	ȗ	DEAD AL 9 U	LATIN SMALL LETTER U WITH INVERTED BREVE
0218	Ș	*HELD AU , S*	LATIN CAPITAL LETTER S WITH COMMA BELOW
0218	Ș	LIVE BU S	LATIN CAPITAL LETTER S WITH COMMA BELOW
0219	ș	*HELD AL , S*	LATIN SMALL LETTER S WITH COMMA BELOW
0219	ș	LIVE BL S	LATIN SMALL LETTER S WITH COMMA BELOW
021A	Ț	*HELD AU , T*	LATIN CAPITAL LETTER T WITH COMMA BELOW
021A	Ț	LIVE BU T	LATIN CAPITAL LETTER T WITH COMMA BELOW
021B	ț	*HELD AL , T*	LATIN SMALL LETTER T WITH COMMA BELOW
021B	ț	LIVE BL T	LATIN SMALL LETTER T WITH COMMA BELOW
021C	Ȝ	DEAD AU 8 3	LATIN CAPITAL LETTER YOGH
021D	ȝ	DEAD AL 8 3	LATIN SMALL LETTER YOGH
021E	Ȟ	DEAD AU 2 H	LATIN CAPITAL LETTER H WITH CARON
021E	Ȟ	DEAD AU] H	LATIN CAPITAL LETTER H WITH CARON

021F	ȟ	DEAD AL 2 H	LATIN SMALL LETTER H WITH CARON
021F	ȟ	DEAD AL] H	LATIN SMALL LETTER H WITH CARON
0220	Ƞ	DEAD AU M N	LATIN CAPITAL LETTER N WITH LONG RIGHT LEG
0221	ɖ	*HELD AL 8 D*	LATIN SMALL LETTER D WITH CURL
0222	Ȣ	DEAD AU X 8	LATIN CAPITAL LETTER OU
0223	ȣ	DEAD AL X 8	LATIN SMALL LETTER OU
0224	Ȝ	DEAD AU 7 Z	LATIN CAPITAL LETTER Z WITH HOOK
0225	ȝ	DEAD AL 7 Z	LATIN SMALL LETTER Z WITH HOOK
0226	Ȧ	DEAD AU . A	LATIN CAPITAL LETTER A WITH DOT ABOVE
0227	ȧ	DEAD AL . A	LATIN SMALL LETTER A WITH DOT ABOVE
0228	Ȩ	DEAD AU , E	LATIN CAPITAL LETTER E WITH CEDILLA
0228	Ȩ	LIVE BC F	LATIN CAPITAL LETTER E WITH CEDILLA
0229	ȩ	DEAD AL , E	LATIN SMALL LETTER E WITH CEDILLA
0229	ȩ	LIVE AB F	LATIN SMALL LETTER E WITH CEDILLA
022A	Ȫ	*HELD AU ; O*	LATIN CAPITAL LETTER O WITH DIAERESIS AND MACRON
022B	ȫ	*HELD AL ; O*	LATIN SMALL LETTER O WITH DIAERESIS AND MACRON
022C	Ȭ	*HELD AU 1 O*	LATIN CAPITAL LETTER O WITH TILDE AND MACRON
022D	ȭ	*HELD AL 1 O*	LATIN SMALL LETTER O WITH TILDE AND MACRON
022E	Ȯ	DEAD AU . O	LATIN CAPITAL LETTER O WITH DOT ABOVE
022F	ȯ	DEAD AL . O	LATIN SMALL LETTER O WITH DOT ABOVE
0230	Ȱ	*HELD AU . O*	LATIN CAPITAL LETTER O WITH DOT ABOVE AND MACRON
0231	ȱ	*HELD AL . O*	LATIN SMALL LETTER O WITH DOT ABOVE AND MACRON
0232	Ȳ	DEAD AU = Y	LATIN CAPITAL LETTER Y WITH MACRON
0232	Ȳ	LIVE BU 6	LATIN CAPITAL LETTER Y WITH MACRON
0233	ȳ	DEAD AL = Y	LATIN SMALL LETTER Y WITH MACRON
0233	ȳ	LIVE BL 6	LATIN SMALL LETTER Y WITH MACRON
0234	ȴ	*HELD AL 8 ;*	LATIN SMALL LETTER L WITH CURL
0235	ȵ	DEAD AL 8 N	LATIN SMALL LETTER N WITH CURL
0236	ȶ	*HELD AL 8 T*	LATIN SMALL LETTER T WITH CURL
0237	ȷ	DEAD AL . J	LATIN SMALL LETTER DOTLESS J
0238	ȸ	*HELD AL 8 B*	LATIN SMALL LETTER DB DIGRAPH
0239	ȹ	*HELD AL 8 P*	LATIN SMALL LETTER QP DIGRAPH
023A	Ⱥ	DEAD AU / A	LATIN CAPITAL LETTER A WITH STROKE
023B	Ȼ	DEAD AU / C	LATIN CAPITAL LETTER C WITH STROKE

023C	ȼ	DEAD AL / C	LATIN SMALL LETTER C WITH STROKE
023D	Ł	DEAD AU - L	LATIN CAPITAL LETTER L WITH BAR
023D	Ł	*HELD AU ; L*	LATIN CAPITAL LETTER L WITH BAR
023E	Ⱦ	DEAD AU / T	LATIN CAPITAL LETTER T WITH DIAGONAL STROKE
023F	ȿ	*HELD AL 5 S*	LATIN SMALL LETTER S WITH SWASH TAIL
0240	ɀ	*HELD AL 5 Z*	LATIN SMALL LETTER Z WITH SWASH TAIL
0241	Ɂ	*HELD AL 9 /*	LATIN CAPITAL LETTER GLOTTAL STOP
0242	ɂ	DEAD AL 9 /	LATIN SMALL LETTER GLOTTAL STOP
0243	Ƀ	DEAD AU - B	LATIN CAPITAL LETTER B WITH STROKE
0243	Ƀ	LIVE AC B	LATIN CAPITAL LETTER B WITH STROKE
0244	Ʉ	DEAD AU - U	LATIN CAPITAL LETTER U BAR
0244	Ʉ	LIVE BC =	LATIN CAPITAL LETTER U BAR
0245	Ʌ	DEAD AU M V	LATIN CAPITAL LETTER TURNED V
0246	Ɇ	DEAD AU / E	LATIN CAPITAL LETTER E WITH STROKE
0247	ɇ	DEAD AL / E	LATIN SMALL LETTER E WITH STROKE
0248	Ɉ	DEAD AU - J	LATIN CAPITAL LETTER J WITH STROKE
0248	Ɉ	DEAD AU . J	LATIN CAPITAL LETTER J WITH STROKE
0249	ɉ	DEAD AL - J	LATIN SMALL LETTER J WITH STROKE
024A	Ɋ	DEAD AU X Q	LATIN CAPITAL LETTER SMALL Q WITH HOOK TAIL
024B	ɋ	DEAD AL X Q	LATIN SMALL LETTER Q WITH HOOK TAIL
024C	Ɍ	DEAD AU - R	LATIN CAPITAL LETTER R WITH STROKE
024D	ɍ	DEAD AL - R	LATIN SMALL LETTER R WITH STROKE
024E	Ɏ	DEAD AU - Y	LATIN CAPITAL LETTER Y WITH STROKE
024F	ɏ	DEAD AL - Y	LATIN SMALL LETTER Y WITH STROKE
0250	ɐ	DEAD AL M A	LATIN SMALL LETTER TURNED A
0251	ɑ	DEAD AL X A	LATIN SMALL LETTER ALPHA
0252	ɒ	DEAD AL M Q	LATIN SMALL LETTER TURNED ALPHA
0253	ɓ	DEAD AL X B	LATIN SMALL LETTER B WITH HOOK
0253	ɓ	LIVE AB ;	LATIN SMALL LETTER B WITH HOOK
0254	ɔ	DEAD AL X O	LATIN SMALL LETTER OPEN O
0254	ɔ	LIVE BL V	LATIN SMALL LETTER OPEN O
0255	ɕ	*HELD AL 8 C*	LATIN SMALL LETTER C WITH CURL
0256	ɖ	DEAD AL M D	LATIN SMALL LETTER D WITH TAIL
0257	ɗ	DEAD AL X D	LATIN SMALL LETTER D WITH HOOK

0257	ɗ	LIVE AB '	LATIN SMALL LETTER D WITH HOOK
0258	ɘ	*HELD AL 2 E*	LATIN SMALL LETTER REVERSED E
0259	ə	DEAD AL X X	LATIN SMALL LETTER SCHWA
0259	ə	LIVE BL `	LATIN SMALL LETTER SCHWA
025A	ɚ	DEAD AL 8 `	LATIN SMALL LETTER SCHWA WITH HOOK
025B	ɛ	DEAD AL X E	LATIN SMALL LETTER OPEN E
025B	ɛ	LIVE BL 2	LATIN SMALL LETTER OPEN E
025C	ɜ	DEAD AL X 3	LATIN SMALL LETTER REVERSED OPEN E
025D	ɝ	*HELD AL 8 `*	LATIN SMALL LETTER REVERSED OPEN E WITH HOOK
025E	ɞ	DEAD AL 3 B	LATIN SMALL LETTER CLOSED REVERSED OPEN E
025F	ɟ	*HELD AL - J*	LATIN SMALL LETTER DOTLESS J WITH STROKE
025F	ɟ	*HELD AL . J*	LATIN SMALL LETTER DOTLESS J WITH STROKE
0260	ɠ	DEAD AL X G	LATIN SMALL LETTER G WITH HOOK
0261	ɡ	DEAD AL M G	LATIN SMALL LETTER SCRIPT G
0262	ɢ	*HELD AL X G*	LATIN LETTER SMALL CAPITAL G
0263	ɣ	LIVE CL X	LATIN SMALL LETTER GAMMA
0264	ɤ	DEAD AL ` G	LATIN SMALL LETTER RAMS HORN
0265	ɥ	DEAD AL X 4	LATIN SMALL LETTER TURNED H
0266	ɦ	DEAD AL X H	LATIN SMALL LETTER H WITH HOOK
0267	ɧ	DEAD AL 3 H	LATIN SMALL LETTER HENG WITH HOOK
0268	ɨ	DEAD AL - I	LATIN SMALL LETTER I WITH STROKE
0268	ɨ	LIVE AB `	LATIN SMALL LETTER I WITH STROKE
0269	ɩ	DEAD AL X I	LATIN SMALL LETTER IOTA
026A	ɪ	*HELD AL X I*	LATIN LETTER SMALL CAPITAL I
026B	ɫ	DEAD AL 2 L	LATIN SMALL LETTER L WITH MIDDLE TILDE
026C	ɬ	DEAD AL ; L	LATIN SMALL LETTER L WITH BELT
026C	ɬ	DEAD AL X L	LATIN SMALL LETTER L WITH BELT
026D	ɭ	*HELD AL 7 L*	LATIN SMALL LETTER L WITH RETROFLEX HOOK
026E	ɮ	*HELD AL 8 J*	LATIN SMALL LETTER LEZH
026F	ɯ	DEAD AL M M	LATIN SMALL LETTER TURNED M
0270	ɰ	DEAD AL 3 M	LATIN SMALL LETTER TURNED M WITH LONG LEG
0271	ɱ	DEAD AL X M	LATIN SMALL LETTER M WITH HOOK
0272	ɲ	DEAD AL X N	LATIN SMALL LETTER N WITH LEFT HOOK
0272	ɲ	LIVE AB B	LATIN SMALL LETTER N WITH LEFT HOOK

0273	ɳ	*HELD AL 7 N*	LATIN SMALL LETTER N WITH RETROFLEX HOOK
0274	ɴ	*HELD AL X N*	LATIN LETTER SMALL CAPITAL N
0275	ɵ	DEAD AL - O	LATIN SMALL LETTER BARRED O
0275	ɵ	DEAD AL 2 O	LATIN SMALL LETTER BARRED O
0275	ɵ	LIVE AB 0	LATIN SMALL LETTER BARRED O
0276	œ	*HELD AU X P*	LATIN LETTER SMALL CAPITAL OE
0277	ɷ	*HELD AL 4 W*	LATIN SMALL LETTER CLOSED OMEGA
0278	ɸ	DEAD AL M F	LATIN SMALL LETTER PHI
0279	ɹ	DEAD AL 0 R	LATIN SMALL LETTER TURNED R
027A	ɺ	*HELD AL 1 R*	LATIN SMALL LETTER TURNED R WITH LONG LEG
027B	ɻ	DEAD AL ` R	LATIN SMALL LETTER TURNED R WITH HOOK
027C	ɾ	DEAD AL 1 R	LATIN SMALL LETTER R WITH LONG LEG
027D	ɽ	DEAD AL X R	LATIN SMALL LETTER R WITH TAIL
027E	ɾ	DEAD AL 7 R	LATIN SMALL LETTER R WITH FISHHOOK
027F	ɿ	*HELD AL 7 R*	LATIN SMALL LETTER REVERSED R WITH FISHHOOK
0280	ʀ	*HELD AL X R*	LATIN LETTER SMALL CAPITAL R
0281	ʁ	*HELD AU X R*	LATIN LETTER SMALL CAPITAL INVERTED R
0282	ʂ	*HELD AL 7 S*	LATIN SMALL LETTER S WITH HOOK
0283	ʃ	DEAD AL X S	LATIN SMALL LETTER ESH
0284	ʄ	DEAD AL M J	LATIN SMALL LETTER DOTLESS J WITH STROKE AND HOOK
0285	ʅ	DEAD AL 5 S	LATIN SMALL LETTER SQUAT REVERSED ESH
0286	ʆ	*HELD AL 8 S*	LATIN SMALL LETTER ESH WITH CURL
0287	ʇ	DEAD AL 0 T	LATIN SMALL LETTER TURNED T
0288	ʈ	*HELD AL 7 T*	LATIN SMALL LETTER T WITH RETROFLEX HOOK
0289	ʉ	DEAD AL - U	LATIN SMALL LETTER U BAR
0289	ʉ	LIVE AB =	LATIN SMALL LETTER U BAR
028A	ʊ	DEAD AL X U	LATIN SMALL LETTER UPSILON
028B	ʋ	DEAD AL X V	LATIN SMALL LETTER V WITH HOOK
028C	ʌ	DEAD AL M V	LATIN SMALL LETTER TURNED V
028D	ʍ	DEAD AL 0 W	LATIN SMALL LETTER TURNED W
028E	ʎ	DEAD AL 0 Y	LATIN SMALL LETTER TURNED Y
028F	ʏ	*HELD AL X Y*	LATIN LETTER SMALL CAPITAL Y
0290	ʐ	*HELD AL 7 Z*	LATIN SMALL LETTER Z WITH RETROFLEX HOOK
0291	ʑ	*HELD AL 8 Z*	LATIN SMALL LETTER Z WITH CURL

0292	ʒ	LIVE BL 4	LATIN SMALL LETTER EZH
0293	ʓ	*HELD AL 8 E*	LATIN SMALL LETTER EZH WITH CURL
0294	ʔ	DEAD AL 9 .	LATIN LETTER GLOTTAL STOP
0294	ʔ	LIVE BL /	LATIN LETTER GLOTTAL STOP
0295	ʕ	DEAD AL 9 ,	LATIN LETTER PHARYNGEAL VOICED FRICATIVE
0296	ʖ	DEAD AL 9 5	LATIN LETTER INVERTED GLOTTAL STOP
0297	ʗ	*HELD AL 9 C*	LATIN LETTER STRETCHED C
0298	ʘ	DEAD AL 9 0	LATIN LETTER BILABIAL CLICK
0299	ʙ	*HELD AL X B*	LATIN LETTER SMALL CAPITAL B
029A	ɐ	*HELD AL 3 B*	LATIN SMALL LETTER CLOSED OPEN E
029B	ɢ	*HELD AU X G*	LATIN LETTER SMALL CAPITAL G WITH HOOK
029C	ʜ	*HELD AL X H*	LATIN LETTER SMALL CAPITAL H
029D	ʝ	DEAD AL X J	LATIN SMALL LETTER J WITH CROSSED-TAIL
029E	ʞ	DEAD AL 0 K	LATIN SMALL LETTER TURNED K
029F	ʟ	*HELD AL X L*	LATIN LETTER SMALL CAPITAL L
02A0	ɋ	DEAD AL 7 Q	LATIN SMALL LETTER Q WITH HOOK
02A1	ʡ	*HELD AL 9 .*	LATIN LETTER GLOTTAL STOP WITH STROKE
02A2	ʢ	*HELD AL 9 ,*	LATIN LETTER REVERSED GLOTTAL STOP WITH STROKE
02A3	ʣ	DEAD AL 8 X	LATIN SMALL LETTER DZ DIGRAPH
02A4	ʤ	DEAD AL 8 J	LATIN SMALL LETTER DEZH DIGRAPH
02A5	ʥ	DEAD AL 8 Z	LATIN SMALL LETTER DZ DIGRAPH WITH CURL
02A6	ʦ	DEAD AL 8 K	LATIN SMALL LETTER TS DIGRAPH
02A7	ʧ	*HELD AL 8 Y*	LATIN SMALL LETTER TESH DIGRAPH
02A8	ʨ	DEAD AL 8 C	LATIN SMALL LETTER TC DIGRAPH WITH CURL
02A9	ʩ	*HELD AL 8 F*	LATIN SMALL LETTER FENG DIGRAPH
02AA	ʪ	*HELD AL 8 K*	LATIN SMALL LETTER LS DIGRAPH
02AB	ʫ	*HELD AL 8 X*	LATIN SMALL LETTER LZ DIGRAPH
02AC	ʬ	*HELD AL 9 W*	LATIN LETTER BILABIAL PERCUSSIVE
02AD	ʭ	*HELD AL 9 [*	LATIN LETTER BIDENTAL PERCUSSIVE
02AE	ʮ	DEAD AL 7 4	LATIN SMALL LETTER TURNED H WITH FISHHOOK
02AF	ʯ	*HELD AL 7 4*	LATIN SMALL LETTER TURNED H WITH FISHHOOK AND TAIL
02B0	ʰ	*HELD AL M H*	MODIFIER LETTER SMALL H
02B1	ʱ	DEAD AL ` H	MODIFIER LETTER SMALL H WITH HOOK
02B2	ʲ	*HELD AL M J*	MODIFIER LETTER SMALL J

02B3	ʳ	*HELD AL M R*	MODIFIER LETTER SMALL R
02B4	ʴ	*HELD AL 6 R*	MODIFIER LETTER SMALL TURNED R
02B5	ʵ	*HELD AL 2 R*	MODIFIER LETTER SMALL TURNED R WITH HOOK
02B6	ʶ	*HELD AL ' R*	MODIFIER LETTER SMALL CAPITAL INVERTED R
02B7	ʷ	*HELD AL M W*	MODIFIER LETTER SMALL W
02B8	ʸ	*HELD AL M Y*	MODIFIER LETTER SMALL Y
02B9	′	DEAD AL M '	MODIFIER LETTER PRIME
02BA	″	*HELD AL M '*	MODIFIER LETTER DOUBLE PRIME
02BB	ʻ	*HELD AL , .*	MODIFIER LETTER TURNED COMMA
02BB	ʻ	*HELD AL . ,*	MODIFIER LETTER TURNED COMMA
02BB	ʻ	*HELD AL ['*	MODIFIER LETTER TURNED COMMA
02BB	ʻ	LIVE AC [	MODIFIER LETTER TURNED COMMA
02BC	ʼ	DEAD AL . ,	MODIFIER LETTER APOSTROPHE
02BC	ʼ	*HELD AL] '*	MODIFIER LETTER APOSTROPHE
02BC	ʼ	LIVE AC]	MODIFIER LETTER APOSTROPHE
02BD	ʽ	*HELD AL [;*	MODIFIER LETTER REVERSED COMMA
02BD	ʽ	LIVE AC '	MODIFIER LETTER REVERSED COMMA
02BE	ʾ	DEAD AL 8]	MODIFIER LETTER RIGHT HALF RING
02BF	ʿ	DEAD AL 8 [	MODIFIER LETTER LEFT HALF RING
02C0	ˀ	DEAD AL 7 SP	MODIFIER LETTER GLOTTAL STOP
02C0	ˀ	DEAD AL 9]	MODIFIER LETTER GLOTTAL STOP
02C1	ˁ	DEAD AL 9 [	MODIFIER LETTER REVERSED GLOTTAL STOP
02C2	˂	DEAD AL M ,	MODIFIER LETTER LEFT ARROWHEAD
02C3	˃	DEAD AL M .	MODIFIER LETTER RIGHT ARROWHEAD
02C4	˄	*HELD AL M ,*	MODIFIER LETTER UP ARROWHEAD
02C5	˅	*HELD AL M .*	MODIFIER LETTER DOWN ARROWHEAD
02C6	ˆ	AL [BL [	MODIFIER LETTER CIRCUMFLEX ACCENT
02C6	ˆ	DEAD AL 6 SP	MODIFIER LETTER CIRCUMFLEX ACCENT
02C7	ˇ	DEAD AL] SP	CARON
02C8	ˈ	DEAD AL - ;	MODIFIER LETTER VERTICAL LINE
02C9	ˉ	*HELD AU = =*	MODIFIER LETTER MACRON
02CA	ˊ	*HELD AU ' '*	MODIFIER LETTER ACUTE ACCENT
02CB	ˋ	DEAD AL ` SP	MODIFIER LETTER GRAVE ACCENT
02CC	ˌ	*HELD AL - ;*	MODIFIER LETTER LOW VERTICAL LINE
02CD	ˍ	AL = BL =	MODIFIER LETTER LOW MACRON

02CE	ˎ	AL ` BL `	MODIFIER LETTER LOW GRAVE ACCENT
02CF	ˏ	AL ' BL '	MODIFIER LETTER LOW ACUTE ACCENT
02CF	ˏ	*HELD AU ' ;*	MODIFIER LETTER LOW ACUTE ACCENT
02D0	ˑ	DEAD AL X ;	MODIFIER LETTER TRIANGULAR COLON
02D0	ˑ	LIVE AC ;	MODIFIER LETTER TRIANGULAR COLON
02D1	˒	DEAD AL X '	MODIFIER LETTER HALF TRIANGULAR COLON
02D2	˓	*HELD AL 8]*	MODIFIER LETTER CENTRED RIGHT HALF RING
02D3	˔	*HELD AL 8 [*	MODIFIER LETTER CENTRED LEFT HALF RING
02D4	˕	*HELD AL /]*	MODIFIER LETTER UP TACK
02D5	˖	*HELD AL / [*	MODIFIER LETTER DOWN TACK
02D6	˗	*HELD AL 2 =*	MODIFIER LETTER PLUS SIGN
02D7	˘	*HELD AL 2 -*	MODIFIER LETTER MINUS SIGN
02D8	˙	DEAD AL 0 SP	BREVE
02D9	˚	DEAD AL . SP	DOT ABOVE
02DA	˛	DEAD AL 8 SP	RING ABOVE
02DB	˜	DEAD AL 5 SP	OGONEK
02DC	˝	AL 2 BL 2	SMALL TILDE
02DC	˝	DEAD AL 1 SP	SMALL TILDE
02DD	˞	*HELD AL 3 '*	DOUBLE ACUTE ACCENT
02DE	˟	*HELD AL , R*	MODIFIER LETTER RHOTIC HOOK
02DF	ˠ	*HELD AU X X*	MODIFIER LETTER CROSS ACCENT
02E0	ˡ	DEAD AL 1 G	MODIFIER LETTER SMALL GAMMA
02E1	ˢ	*HELD AL M L*	MODIFIER LETTER SMALL L
02E2	ˣ	*HELD AL M S*	MODIFIER LETTER SMALL S
02E3	ˤ	*HELD AL M X*	MODIFIER LETTER SMALL X
02E4	˥	DEAD AL 9 \	MODIFIER LETTER SMALL REVERSED GLOTTAL STOP
02E5	˦	*HELD AL - 1*	MODIFIER LETTER EXTRA-HIGH TONE BAR
02E6	˧	*HELD AL - 2*	MODIFIER LETTER HIGH TONE BAR
02E7	˨	*HELD AL - 3*	MODIFIER LETTER MID TONE BAR
02E8	˩	*HELD AL - 4*	MODIFIER LETTER LOW TONE BAR
02E9	˪	*HELD AL - 5*	MODIFIER LETTER EXTRA-LOW TONE BAR
02EC	ˬ	AL] BL]	MODIFIER LETTER VOICING
02ED	˭	DEAD AL M -	MODIFIER LETTER UNASPIRATED
02EE	ˮ	*HELD AL] ;*	MODIFIER LETTER DOUBLE APOSTROPHE
02EF	˯	*HELD AL ' .*	MODIFIER LETTER LOW DOWN ARROWHEAD

02F0	ˬ	*HELD AL ' ,*	MODIFIER LETTER LOW UP ARROWHEAD
02F1	˭	DEAD AL ' ,	MODIFIER LETTER LOW LEFT ARROWHEAD
02F2	ˮ	DEAD AL ' .	MODIFIER LETTER LOW RIGHT ARROWHEAD
02F3	˯	AL 8 BL 8	MODIFIER LETTER LOW RING
02F4	˰	DEAD AL M `	MODIFIER LETTER MIDDLE GRAVE ACCENT
02F5	˱	AL 3 BL 3	MODIFIER LETTER MIDDLE DOUBLE GRAVE ACCENT
02F6	˲	DEAD AL 3 SP	MODIFIER LETTER MIDDLE DOUBLE ACUTE ACCENT
02F7	˳	AL 1 BL 1	MODIFIER LETTER LOW TILDE
02F7	˳	DEAD AL 2 SP	MODIFIER LETTER LOW TILDE
02F8	˴	DEAD AL 6 ;	MODIFIER LETTER RAISED COLON
02F9	˵	DEAD AL 7 [	MODIFIER LETTER BEGIN HIGH TONE
02FA	˶	DEAD AL 7]	MODIFIER LETTER END HIGH TONE
02FB	˷	*HELD AL 7 [*	MODIFIER LETTER BEGIN LOW TONE
02FC	˸	*HELD AL 7]*	MODIFIER LETTER END LOW TONE
02FD	˹	*HELD AL 6]*	MODIFIER LETTER SHELF

Range U+0300 to U+0FFF

U+	Sym	Key Sequence	Description
0300	ò	*HELD AL ` `*	COMBINING GRAVE ACCENT
0301	o'	*HELD AL ' '*	COMBINING ACUTE ACCENT
0302	ô	DEAD AL [[	COMBINING CIRCUMFLEX ACCENT
0302	ô	*HELD AL 6 6*	COMBINING CIRCUMFLEX ACCENT
0303	o	*HELD AL 1 1*	COMBINING TILDE
0304	ō	*HELD AL = =*	COMBINING MACRON
0305	o̅	*HELD AL - -*	COMBINING OVERLINE
0306	ŏ	*HELD AL 0 0*	COMBINING BREVE
0307	ȯ	*HELD AL . .*	COMBINING DOT ABOVE
0308	ö	*HELD AL ; ;*	COMBINING DIAERESIS
0309	o	*HELD AL 7 7*	COMBINING HOOK ABOVE
030A	ů	*HELD AL 8 8*	COMBINING RING ABOVE
030B	ő	*HELD AL 3 3*	COMBINING DOUBLE ACUTE ACCENT
030C	ǒ	*HELD AL]]*	COMBINING CARON
030D	o̍	DEAD AL - '	COMBINING VERTICAL LINE ABOVE
030E	o̎	DEAD AL = '	COMBINING DOUBLE VERTICAL LINE ABOVE
030F	ȍ	DEAD AL 3 3	COMBINING DOUBLE GRAVE ACCENT
0310	o̐	*HELD AL . 0*	COMBINING CANDRABINDU
0311	ȏ	*HELD AL 9 9*	COMBINING INVERTED BREVE
0312	o̒	*HELD AL , 6*	COMBINING TURNED COMMA ABOVE
0313	o̓	*HELD AL , 9*	COMBINING COMMA ABOVE
0314	o̔	*HELD AL , 8*	COMBINING REVERSED COMMA ABOVE
0315	o̕	*HELD AL , 7*	COMBINING COMMA ABOVE RIGHT
0316	o̖	DEAD AL ` `	COMBINING GRAVE ACCENT BELOW
0317	o̗	DEAD AL ' '	COMBINING ACUTE ACCENT BELOW
0318	o̘	DEAD AL 0]	COMBINING LEFT TACK BELOW
0319	o̙	DEAD AL 0 [	COMBINING RIGHT TACK BELOW
031A	o̚	*HELD AL 6 -*	COMBINING LEFT ANGLE ABOVE
031B	ơ	*HELD AL , M*	COMBINING HORN
031C	o̜	*HELD AU 8 9*	COMBINING LEFT HALF RING BELOW
031D	o̝	*HELD AL 0]*	COMBINING UP TACK BELOW

031E	Q̪	*HELD AL 0 [*	COMBINING DOWN TACK BELOW
031F	Q̟	*HELD AL 8 =*	COMBINING PLUS SIGN BELOW
0320	Q̠	*HELD AL 8 -*	COMBINING MINUS SIGN BELOW
0321	Q̡	*HELD AL , J*	COMBINING PALATALIZED HOOK BELOW
0322	Q̢	*HELD AL , L*	COMBINING RETROFLEX HOOK BELOW
0323	Q̣	DEAD AL . .	COMBINING DOT BELOW
0323	Q̣	*HELD AL \ *	COMBINING DOT BELOW
0324	Q̤	DEAD AL ; ;	COMBINING DIAERESIS BELOW
0325	Q̥	DEAD AL 8 8	COMBINING RING BELOW
0326	Q̦	DEAD AL , ,	COMBINING COMMA BELOW
0327	Q̧	*HELD AL , ,*	COMBINING CEDILLA
0328	Q̨	*HELD AL 5 5*	COMBINING OGONEK
0329	Q̩	*HELD AL - '*	COMBINING VERTICAL LINE BELOW
032A	Q̪	DEAD AL [\	COMBINING BRIDGE BELOW
032B	Q̫	*HELD AL 9 0*	COMBINING INVERTED DOUBLE ARCH BELOW
032C	Q̬	DEAD AL]]	COMBINING CARON BELOW
032D	Q̭	DEAD AL 6 6	COMBINING CIRCUMFLEX ACCENT BELOW
032D	Q̭	*HELD AL [[*	COMBINING CIRCUMFLEX ACCENT BELOW
032E	Q̮	DEAD AL 0 0	COMBINING BREVE BELOW
032F	Q̯	DEAD AL 9 9	COMBINING INVERTED BREVE BELOW
0330	Q̰	DEAD AL 1 1	COMBINING TILDE BELOW
0330	Q̰	*HELD AL 2 2*	COMBINING TILDE BELOW
0331	Q̱	DEAD AL = =	COMBINING MACRON BELOW
0332	Q̲	DEAD AL - -	COMBINING LOW LINE
0333	Q̳	*HELD AL M =*	COMBINING DOUBLE LOW LINE
0334	Q̴	DEAD AL 2 2	COMBINING TILDE OVERLAY
0335	Q̵	DEAD AL = -	COMBINING SHORT STROKE OVERLAY
0336	Q̶	*HELD AL = -*	COMBINING LONG STROKE OVERLAY
0337	Q̷	DEAD AL / /	COMBINING SHORT SOLIDUS OVERLAY
0338	Q̸	*HELD AL / /*	COMBINING LONG SOLIDUS OVERLAY
0339	Q̹	*HELD AU 8 0*	COMBINING RIGHT HALF RING BELOW
033A	Q̺	DEAD AL] \	COMBINING INVERTED BRIDGE BELOW
033B	Q̻	*HELD AL 8 7*	COMBINING SQUARE BELOW

033C	o̪	HELD AL 0 9	COMBINING SEAGULL BELOW
033D	o̭	DEAD AL / X	COMBINING X ABOVE
033E	o̰	HELD AL 2 1	COMBINING VERTICAL TILDE
033F	o̿	HELD AL M -	COMBINING DOUBLE OVERLINE
0340	ò	DEAD AL ` ;	COMBINING GRAVE TONE MARK
0341	ó	DEAD AL ' ;	COMBINING ACUTE TONE MARK
0342	õ	HELD AL 2 `	COMBINING GREEK PERISPOMENI
0344	ö́	HELD AL 4 4	COMBINING GREEK DIALYTIKA TONOS
0346	ō	DEAD AL [ ]	COMBINING BRIDGE ABOVE
0347	o̱	HELD AU M =	COMBINING EQUALS SIGN BELOW
0348	o̮	HELD AL = '	COMBINING DOUBLE VERTICAL LINE BELOW
0349	o̬	DEAD AL 6 -	COMBINING LEFT ANGLE BELOW
034E	o̝	DEAD AL 8 /	COMBINING UPWARDS ARROW BELOW
034F		HELD AL / C	COMBINING GRAPHEME JOINER
0350	o̚	DEAD AL ; .	COMBINING RIGHT ARROWHEAD ABOVE
0351	o̓	HELD AL 8 9	COMBINING LEFT HALF RING ABOVE
0352	o̔	HELD AL . 9	COMBINING FERMATA
0353	o̞	DEAD AL \ X	COMBINING X BELOW
0354	o̟	HELD AL ; ,	COMBINING LEFT ARROWHEAD BELOW
0355	o̠	HELD AL ; .	COMBINING RIGHT ARROWHEAD BELOW
0357	o̕	HELD AL 8 0	COMBINING RIGHT HALF RING ABOVE
0358	ȯ	HELD AU . /	COMBINING DOT ABOVE RIGHT
0359	o̡	DEAD AL 6 8	COMBINING ASTERISK BELOW
035B	ơ	DEAD AL / Z	COMBINING ZIGZAG ABOVE
035C	o͜	DEAD AU 0 0	COMBINING DOUBLE BREVE BELOW
035D	o͝	HELD AU 0 0	COMBINING DOUBLE BREVE
035E	o͞	HELD AL = 9	COMBINING DOUBLE MACRON
035F	o͟	HELD AL = 0	COMBINING DOUBLE MACRON BELOW
0360	o͠	HELD AU 1 1	COMBINING DOUBLE TILDE
0361	o͡	HELD AU 9 9	COMBINING DOUBLE INVERTED BREVE
0363	oᵃ	HELD AU 0 A	COMBINING LATIN SMALL LETTER A
0364	oᵉ	HELD AU 0 E	COMBINING LATIN SMALL LETTER E
0365	oⁱ	HELD AU 0 I	COMBINING LATIN SMALL LETTER I

0366	ͦ	*HELD AU 0 O*	COMBINING LATIN SMALL LETTER O
0367	ͤ	*HELD AU 0 U*	COMBINING LATIN SMALL LETTER U
0368	ͨ	*HELD AU 0 C*	COMBINING LATIN SMALL LETTER C
0369	ͩ	*HELD AU 0 D*	COMBINING LATIN SMALL LETTER D
036A	ͪ	*HELD AU 0 H*	COMBINING LATIN SMALL LETTER H
036B	ͫ	*HELD AU 0 M*	COMBINING LATIN SMALL LETTER M
036C	ͬ	*HELD AU 0 R*	COMBINING LATIN SMALL LETTER R
036D	ͭ	*HELD AU 0 T*	COMBINING LATIN SMALL LETTER T
036E	ͮ	*HELD AU 0 V*	COMBINING LATIN SMALL LETTER V
036F	ͯ	*HELD AU 0 X*	COMBINING LATIN SMALL LETTER X
0385	·΄	DEAD AL 4 SP	GREEK DIALYTIKA TONOS
0386	Ά	*HELD AU 4 A*	GREEK CAPITAL LETTER ALPHA WITH TONOS
0388	Έ	*HELD AU 4 E*	GREEK CAPITAL LETTER EPSILON WITH TONOS
0389	Ή	*HELD AU 4 H*	GREEK CAPITAL LETTER ETA WITH TONOS
038A	Ί	*HELD AU 4 I*	GREEK CAPITAL LETTER IOTA WITH TONOS
038C	Ό	*HELD AU 4 O*	GREEK CAPITAL LETTER OMICRON WITH TONOS
038E	Ύ	*HELD AU 4 Y*	GREEK CAPITAL LETTER UPSILON WITH TONOS
038F	Ώ	*HELD AU 4 V*	GREEK CAPITAL LETTER OMEGA WITH TONOS
0390	ΐ	*HELD AL 6 I*	GREEK SMALL LETTER IOTA WITH DIALYTIKA AND TONOS
0391	Α	DEAD AU 4 A	GREEK CAPITAL LETTER ALPHA
0392	Β	DEAD AU 4 B	GREEK CAPITAL LETTER BETA
0393	Γ	DEAD AU 4 G	GREEK CAPITAL LETTER GAMMA
0394	Δ	DEAD AU 4 D	GREEK CAPITAL LETTER DELTA
0395	Ε	DEAD AU 4 E	GREEK CAPITAL LETTER EPSILON
0396	Ζ	DEAD AU 4 Z	GREEK CAPITAL LETTER ZETA
0397	Η	DEAD AU 4 H	GREEK CAPITAL LETTER ETA
0398	Θ	DEAD AU 4 U	GREEK CAPITAL LETTER THETA
0399	Ι	DEAD AU 4 I	GREEK CAPITAL LETTER IOTA
039A	Κ	DEAD AU 4 K	GREEK CAPITAL LETTER KAPPA
039B	Λ	DEAD AU 4 L	GREEK CAPITAL LETTER LAMDA
039C	Μ	DEAD AU 4 M	GREEK CAPITAL LETTER MU
039D	Ν	DEAD AU 4 N	GREEK CAPITAL LETTER NU
039E	Ξ	DEAD AU 4 J	GREEK CAPITAL LETTER XI

039F	Ο	DEAD AU 4 O	GREEK CAPITAL LETTER OMICRON
03A0	Π	DEAD AU 4 P	GREEK CAPITAL LETTER PI
03A1	Ρ	DEAD AU 4 R	GREEK CAPITAL LETTER RHO
03A3	Σ	DEAD AU 4 S	GREEK CAPITAL LETTER SIGMA
03A4	Τ	DEAD AU 4 T	GREEK CAPITAL LETTER TAU
03A5	Υ	DEAD AU 4 Y	GREEK CAPITAL LETTER UPSILON
03A6	Φ	DEAD AU 4 F	GREEK CAPITAL LETTER PHI
03A7	Χ	DEAD AU 4 X	GREEK CAPITAL LETTER CHI
03A8	Ψ	DEAD AU 4 C	GREEK CAPITAL LETTER PSI
03A9	Ω	DEAD AU 4 V	GREEK CAPITAL LETTER OMEGA
03AA	Ϊ	*HELD AU 5 I*	GREEK CAPITAL LETTER IOTA WITH DIALYTIKA
03AB	Ϋ	*HELD AU 5 Y*	GREEK CAPITAL LETTER UPSILON WITH DIALYTIKA
03AC	ά	*HELD AL 4 A*	GREEK SMALL LETTER ALPHA WITH TONOS
03AD	έ	*HELD AL 4 E*	GREEK SMALL LETTER EPSILON WITH TONOS
03AE	ή	*HELD AL 4 H*	GREEK SMALL LETTER ETA WITH TONOS
03AF	ί	*HELD AL 4 I*	GREEK SMALL LETTER IOTA WITH TONOS
03B0	ΰ	*HELD AL 6 Y*	GREEK SMALL LETTER UPSILON WITH DIALYTIKA AND TONOS
03B1	α	DEAD AL 4 A	GREEK SMALL LETTER ALPHA
03B2	β	DEAD AL 4 B	GREEK SMALL LETTER BETA
03B3	γ	DEAD AL 4 G	GREEK SMALL LETTER GAMMA
03B4	δ	DEAD AL 4 D	GREEK SMALL LETTER DELTA
03B5	ε	DEAD AL 4 E	GREEK SMALL LETTER EPSILON
03B6	ζ	DEAD AL 4 Z	GREEK SMALL LETTER ZETA
03B7	η	DEAD AL 4 H	GREEK SMALL LETTER ETA
03B8	θ	DEAD AL 4 U	GREEK SMALL LETTER THETA
03B9	ι	DEAD AL 4 I	GREEK SMALL LETTER IOTA
03BA	κ	DEAD AL 4 K	GREEK SMALL LETTER KAPPA
03BB	λ	DEAD AL 4 L	GREEK SMALL LETTER LAMDA
03BC	μ	DEAD AL 4 M	GREEK SMALL LETTER MU
03BD	ν	DEAD AL 4 N	GREEK SMALL LETTER NU
03BE	ξ	DEAD AL 4 J	GREEK SMALL LETTER XI
03BF	ο	DEAD AL 4 O	GREEK SMALL LETTER OMICRON
03C0	π	DEAD AL 4 P	GREEK SMALL LETTER PI
03C1	ρ	DEAD AL 4 R	GREEK SMALL LETTER RHO

03C2	ς	*HELD AL 4 S*	GREEK SMALL LETTER FINAL SIGMA
03C3	σ	DEAD AL 4 S	GREEK SMALL LETTER SIGMA
03C4	τ	DEAD AL 4 T	GREEK SMALL LETTER TAU
03C5	υ	DEAD AL 4 Y	GREEK SMALL LETTER UPSILON
03C6	φ	DEAD AL 4 F	GREEK SMALL LETTER PHI
03C7	χ	DEAD AL 4 X	GREEK SMALL LETTER CHI
03C8	ψ	DEAD AL 4 C	GREEK SMALL LETTER PSI
03C9	ω	DEAD AL 4 V	GREEK SMALL LETTER OMEGA
03CA	ϊ	*HELD AL 5 I*	GREEK SMALL LETTER IOTA WITH DIALYTIKA
03CB	ϋ	*HELD AL 5 Y*	GREEK SMALL LETTER UPSILON WITH DIALYTIKA
03CC	ό	*HELD AL 4 O*	GREEK SMALL LETTER OMICRON WITH TONOS
03CD	ύ	*HELD AL 4 Y*	GREEK SMALL LETTER UPSILON WITH TONOS
03CE	ώ	*HELD AL 4 V*	GREEK SMALL LETTER OMEGA WITH TONOS
03D0	ϐ	*HELD AL 4 B*	GREEK BETA SYMBOL
03D1	ϑ	DEAD AL 4 Q	GREEK THETA SYMBOL
03D2	ϒ	DEAD AL 4 7	GREEK UPSILON WITH HOOK SYMBOL
03D5	ϕ	DEAD AL 4 0	GREEK PHI SYMBOL
03D6	ϖ	*HELD AL 4 P*	GREEK PI SYMBOL
03D7	ϗ	*HELD AL 4 7*	GREEK KAI SYMBOL
03F0	ϰ	*HELD AL 4 K*	GREEK KAPPA SYMBOL
03F1	ϱ	*HELD AL 4 R*	GREEK RHO SYMBOL
03F4	Θ	DEAD AU 4 Q	GREEK CAPITAL THETA SYMBOL
03F5	ϵ	*HELD AL 4 3*	GREEK LUNATE EPSILON SYMBOL
03F6	ϵ	DEAD AL 4 3	GREEK REVERSED LUNATE EPSILON SYMBOL
03FC	ϱ	*HELD AL 4 T*	GREEK RHO WITH STROKE SYMBOL
0400	È	*HELD AU ` E*	CYRILLIC CAPITAL LETTER IE WITH GRAVE
0401	Ё	*HELD AU W E*	CYRILLIC CAPITAL LETTER IO
0402	Ђ	DEAD AU W 5	CYRILLIC CAPITAL LETTER DJE
0403	Ѓ	*HELD AU ' 7*	CYRILLIC CAPITAL LETTER GJE
0404	Є	DEAD AU 6 2	CYRILLIC CAPITAL LETTER UKRAINIAN IE
0405	S	DEAD AU W S	CYRILLIC CAPITAL LETTER DZE
0406	І	DEAD AU W I	CYRILLIC CAPITAL LETTER BYELORUSSIAN-UKRAINIAN I
0407	Ї	*HELD AU W I*	CYRILLIC CAPITAL LETTER YI
0408	J	DEAD AU W J	CYRILLIC CAPITAL LETTER JE

0409	Љ	*HELD AU \ L*	CYRILLIC CAPITAL LETTER LJE
040A	Њ	*HELD AU \ H*	CYRILLIC CAPITAL LETTER NJE
040B	Ћ	*HELD AU W 5*	CYRILLIC CAPITAL LETTER TSHE
040C	Ќ	*HELD AU , K*	CYRILLIC CAPITAL LETTER KJE
040D	Ѝ	*HELD AU ` N*	CYRILLIC CAPITAL LETTER I WITH GRAVE
040E	Ў	*HELD AU 0 Y*	CYRILLIC CAPITAL LETTER SHORT U
040F	Ц	*HELD AU W U*	CYRILLIC CAPITAL LETTER DZHE
0410	А	DEAD AU W A	CYRILLIC CAPITAL LETTER A
0411	Б	DEAD AU W 6	CYRILLIC CAPITAL LETTER BE
0412	В	DEAD AU W B	CYRILLIC CAPITAL LETTER VE
0413	Г	DEAD AU W 7	CYRILLIC CAPITAL LETTER GHE
0414	Д	DEAD AU W D	CYRILLIC CAPITAL LETTER DE
0415	Е	DEAD AU W E	CYRILLIC CAPITAL LETTER IE
0416	Ж	DEAD AU W [	CYRILLIC CAPITAL LETTER ZHE
0417	З	DEAD AU W 3	CYRILLIC CAPITAL LETTER ZE
0418	И	DEAD AU W N	CYRILLIC CAPITAL LETTER I
0419	Й	DEAD AU W Z	CYRILLIC CAPITAL LETTER SHORT I
041A	К	DEAD AU W K	CYRILLIC CAPITAL LETTER KA
041B	Л	DEAD AU W L	CYRILLIC CAPITAL LETTER EL
041C	М	DEAD AU W M	CYRILLIC CAPITAL LETTER EM
041D	Н	DEAD AU W H	CYRILLIC CAPITAL LETTER EN
041E	О	DEAD AU W O	CYRILLIC CAPITAL LETTER O
041F	П	DEAD AU W V	CYRILLIC CAPITAL LETTER PE
0420	Р	DEAD AU W P	CYRILLIC CAPITAL LETTER ER
0421	С	DEAD AU W C	CYRILLIC CAPITAL LETTER ES
0422	Т	DEAD AU W T	CYRILLIC CAPITAL LETTER TE
0423	У	DEAD AU W Y	CYRILLIC CAPITAL LETTER U
0424	Ф	DEAD AU W 0	CYRILLIC CAPITAL LETTER EF
0425	Х	DEAD AU W X	CYRILLIC CAPITAL LETTER HA
0426	Ц	DEAD AU W U	CYRILLIC CAPITAL LETTER TSE
0427	Ч	DEAD AU W 4	CYRILLIC CAPITAL LETTER CHE
0428	Ш	DEAD AU W W	CYRILLIC CAPITAL LETTER SHA
0429	Щ	*HELD AU W W*	CYRILLIC CAPITAL LETTER SHCHA
042A	Ъ	*HELD AU 7 6*	CYRILLIC CAPITAL LETTER HARD SIGN

042A	Ъ	*HELD AU W B*	CYRILLIC CAPITAL LETTER HARD SIGN
042B	Ы	DEAD AU 6 1	CYRILLIC CAPITAL LETTER YERU
042C	Ь	*HELD AU W 6*	CYRILLIC CAPITAL LETTER SOFT SIGN
042C	Ь	DEAD AL 7 6	CYRILLIC CAPITAL LETTER SOFT SIGN
042D	Э	DEAD AU W 2	CYRILLIC CAPITAL LETTER E
042E	Ю	DEAD AU 1 0	CYRILLIC CAPITAL LETTER YU
042F	Я	DEAD AU W R	CYRILLIC CAPITAL LETTER YA
0430	а	DEAD AL W A	CYRILLIC SMALL LETTER A
0431	б	DEAD AL W 6	CYRILLIC SMALL LETTER BE
0432	в	DEAD AL W B	CYRILLIC SMALL LETTER VE
0433	г	DEAD AL W 7	CYRILLIC SMALL LETTER GHE
0434	д	DEAD AL W D	CYRILLIC SMALL LETTER DE
0435	е	DEAD AL W E	CYRILLIC SMALL LETTER IE
0436	ж	DEAD AL W [	CYRILLIC SMALL LETTER ZHE
0437	з	DEAD AL W 3	CYRILLIC SMALL LETTER ZE
0438	и	DEAD AL W N	CYRILLIC SMALL LETTER I
0439	й	DEAD AL W Z	CYRILLIC SMALL LETTER SHORT I
043A	к	DEAD AL W K	CYRILLIC SMALL LETTER KA
043B	л	DEAD AL W L	CYRILLIC SMALL LETTER EL
043C	м	DEAD AL W M	CYRILLIC SMALL LETTER EM
043D	н	DEAD AL W H	CYRILLIC SMALL LETTER EN
043E	о	DEAD AL W O	CYRILLIC SMALL LETTER O
043F	п	DEAD AL W V	CYRILLIC SMALL LETTER PE
0440	р	DEAD AL W P	CYRILLIC SMALL LETTER ER
0441	с	DEAD AL W C	CYRILLIC SMALL LETTER ES
0442	т	DEAD AL W T	CYRILLIC SMALL LETTER TE
0443	у	DEAD AL W Y	CYRILLIC SMALL LETTER U
0444	ф	DEAD AL W 0	CYRILLIC SMALL LETTER EF
0445	х	DEAD AL W X	CYRILLIC SMALL LETTER HA
0446	ц	DEAD AL W U	CYRILLIC SMALL LETTER TSE
0447	ч	DEAD AL W 4	CYRILLIC SMALL LETTER CHE
0448	ш	DEAD AL W W	CYRILLIC SMALL LETTER SHA
0449	щ	*HELD AL W W*	CYRILLIC SMALL LETTER SHCHA
044A	ъ	*HELD AL 7 6*	CYRILLIC SMALL LETTER HARD SIGN

044A	ъ	*HELD AL W B*	CYRILLIC SMALL LETTER HARD SIGN
044B	ы	DEAD AL 6 1	CYRILLIC SMALL LETTER YERU
044C	ь	*HELD AL W 6*	CYRILLIC SMALL LETTER SOFT SIGN
044C	ь	DEAD AL 7 6	CYRILLIC SMALL LETTER SOFT SIGN
044D	э	DEAD AL W 2	CYRILLIC SMALL LETTER E
044E	ю	DEAD AL 1 0	CYRILLIC SMALL LETTER YU
044F	я	DEAD AL W R	CYRILLIC SMALL LETTER YA
0450	ѐ	*HELD AL ` E*	CYRILLIC SMALL LETTER IE WITH GRAVE
0451	ё	*HELD AL W E*	CYRILLIC SMALL LETTER IO
0452	ђ	DEAD AL W 5	CYRILLIC SMALL LETTER DJE
0453	ѓ	*HELD AL ' 7*	CYRILLIC SMALL LETTER GJE
0454	є	DEAD AL 6 2	CYRILLIC SMALL LETTER UKRAINIAN IE
0455	ѕ	DEAD AL W S	CYRILLIC SMALL LETTER DZE
0456	і	DEAD AL W I	CYRILLIC SMALL LETTER BYELORUSSIAN-UKRAINIAN I
0457	ї	*HELD AL W I*	CYRILLIC SMALL LETTER YI
0458	ј	DEAD AL W J	CYRILLIC SMALL LETTER JE
0459	љ	*HELD AL \ L*	CYRILLIC SMALL LETTER LJE
045A	њ	*HELD AL \ H*	CYRILLIC SMALL LETTER NJE
045B	ћ	*HELD AL W 5*	CYRILLIC SMALL LETTER TSHE
045C	ќ	*HELD AL , K*	CYRILLIC SMALL LETTER KJE
045D	ѝ	*HELD AL ` N*	CYRILLIC SMALL LETTER I WITH GRAVE
045E	ў	*HELD AL 0 Y*	CYRILLIC SMALL LETTER SHORT U
045F	ц	*HELD AL W U*	CYRILLIC SMALL LETTER DZHE
0460	Ѡ	DEAD AU 2 W	CYRILLIC CAPITAL LETTER OMEGA
0461	ѡ	DEAD AL 2 W	CYRILLIC SMALL LETTER OMEGA
0462	Ѣ	DEAD AU 6 B	CYRILLIC CAPITAL LETTER YAT
0463	ѣ	DEAD AL 6 B	CYRILLIC SMALL LETTER YAT
0464	Ѥ	*HELD AU 1 E*	CYRILLIC CAPITAL LETTER IOTIFIED E
0465	ѥ	*HELD AL 1 E*	CYRILLIC SMALL LETTER IOTIFIED E
0466	Ѧ	DEAD AU W =	CYRILLIC CAPITAL LETTER LITTLE YUS
0467	ѧ	DEAD AL W =	CYRILLIC SMALL LETTER LITTLE YUS
0468	Ѩ	DEAD AU W \	CYRILLIC CAPITAL LETTER IOTIFIED LITTLE YUS
0469	ѩ	DEAD AL W \	CYRILLIC SMALL LETTER IOTIFIED LITTLE YUS
046A	Ѫ	*HELD AU W =*	CYRILLIC CAPITAL LETTER BIG YUS

046B	ѫ	HELD AL W =	CYRILLIC SMALL LETTER BIG YUS
046C	Ѭ	HELD AU W \	CYRILLIC CAPITAL LETTER IOTIFIED BIG YUS
046D	ѭ	HELD AL W \	CYRILLIC SMALL LETTER IOTIFIED BIG YUS
046E	Ѯ	HELD AU W 8	CYRILLIC CAPITAL LETTER KSI
046F	ѯ	HELD AL W 8	CYRILLIC SMALL LETTER KSI
0470	Ѱ	HELD AU W 0	CYRILLIC CAPITAL LETTER PSI
0471	ѱ	HELD AL W 0	CYRILLIC SMALL LETTER PSI
0472	Ѳ	HELD AU 6 0	CYRILLIC CAPITAL LETTER FITA
0473	ѳ	HELD AL 6 0	CYRILLIC SMALL LETTER FITA
0474	Ѵ	DEAD AU 6 V	CYRILLIC CAPITAL LETTER IZHITSA
0475	ѵ	DEAD AL 6 V	CYRILLIC SMALL LETTER IZHITSA
0476	Ѷ̏	HELD AU 6 V	CYRILLIC CAPITAL LETTER IZHITSA WITH DOUBLE GRAVE ACCENT
0477	ѶѶ̏	HELD AL 6 V	CYRILLIC SMALL LETTER IZHITSA WITH DOUBLE GRAVE ACCENT
0478	Ѹ	HELD AU W 1	CYRILLIC CAPITAL LETTER UK
0479	ѹ	HELD AL W 1	CYRILLIC SMALL LETTER UK
047A	Ѻ	HELD AU 6 O	CYRILLIC CAPITAL LETTER ROUND OMEGA
047B	ѻ	HELD AL 6 O	CYRILLIC SMALL LETTER ROUND OMEGA
047E	Ѽ	HELD AU 2 W	CYRILLIC CAPITAL LETTER OT
047F	ѽ	HELD AL 2 W	CYRILLIC SMALL LETTER OT
0480	Ҁ	HELD AU 2 C	CYRILLIC CAPITAL LETTER KOPPA
0481	ҁ	HELD AL 2 C	CYRILLIC SMALL LETTER KOPPA
0483	◌҃	HELD AL W -	COMBINING CYRILLIC TITLO
0484	◌҄	HELD AL W ;	COMBINING CYRILLIC PALATALIZATION
0485	◌҅	HELD AL W `	COMBINING CYRILLIC DASIA PNEUMATA
0486	◌҆	HELD AL W '	COMBINING CYRILLIC PSILI PNEUMATA
0487	◌҇	HELD AL W 9	COMBINING CYRILLIC POKRYTIE
048A	Ҋ	HELD AU W Z	CYRILLIC CAPITAL LETTER SHORT I WITH TAIL
048B	ҋ	HELD AL W Z	CYRILLIC SMALL LETTER SHORT I WITH TAIL
048C	Ҍ	DEAD AU 8 B	CYRILLIC CAPITAL LETTER SEMISOFT SIGN
048D	ҍ	DEAD AL 8 B	CYRILLIC SMALL LETTER SEMISOFT SIGN
048E	Ҏ	HELD AU W P	CYRILLIC CAPITAL LETTER ER WITH TICK
048F	ҏ	HELD AL W P	CYRILLIC SMALL LETTER ER WITH TICK
0490	Ґ	HELD AU 6 7	CYRILLIC CAPITAL LETTER GHE WITH UPTURN
0491	ґ	HELD AL 6 7	CYRILLIC SMALL LETTER GHE WITH UPTURN

0492	Ғ	DEAD AU W F	CYRILLIC CAPITAL LETTER GHE WITH STROKE
0493	ғ	DEAD AL W F	CYRILLIC SMALL LETTER GHE WITH STROKE
0494	Ҕ	HELD AU 6 5	CYRILLIC CAPITAL LETTER GHE WITH MIDDLE HOOK
0495	ҕ	HELD AL 6 5	CYRILLIC SMALL LETTER GHE WITH MIDDLE HOOK
0496	Ж̣	HELD AU W [	CYRILLIC CAPITAL LETTER ZHE WITH DESCENDER
0497	ж̣	HELD AL W [	CYRILLIC SMALL LETTER ZHE WITH DESCENDER
0498	Ҙ	HELD AU , 3	CYRILLIC CAPITAL LETTER ZE WITH DESCENDER
0499	ҙ	HELD AL , 3	CYRILLIC SMALL LETTER ZE WITH DESCENDER
049A	ҚҚ	HELD AU W K	CYRILLIC CAPITAL LETTER KA WITH DESCENDER
049B	ҚҚ	HELD AL W K	CYRILLIC SMALL LETTER KA WITH DESCENDER
049C	Ҝ	HELD AU 6 K	CYRILLIC CAPITAL LETTER KA WITH VERTICAL STROKE
049D	ҝ	HELD AL 6 K	CYRILLIC SMALL LETTER KA WITH VERTICAL STROKE
049E	Ҟ	DEAD AU 6 K	CYRILLIC CAPITAL LETTER KA WITH STROKE
049F	ҟ	DEAD AL 6 K	CYRILLIC SMALL LETTER KA WITH STROKE
04A0	Ҡ	HELD AU ; K	CYRILLIC CAPITAL LETTER BASHKIR KA
04A1	ҡ	HELD AL ; K	CYRILLIC SMALL LETTER BASHKIR KA
04A2	Ҥ	HELD AU W H	CYRILLIC CAPITAL LETTER EN WITH DESCENDER
04A3	ҥ	HELD AL W H	CYRILLIC SMALL LETTER EN WITH DESCENDER
04A4	Ҥ	HELD AU 7 H	CYRILLIC CAPITAL LIGATURE EN GHE
04A5	ҥ	HELD AL 7 H	CYRILLIC SMALL LIGATURE EN GHE
04A6	Ҧ	HELD AU . V	CYRILLIC CAPITAL LETTER PE WITH MIDDLE HOOK
04A7	ҧ	HELD AL . V	CYRILLIC SMALL LETTER PE WITH MIDDLE HOOK
04A8	Ҩ	HELD AU W S	CYRILLIC CAPITAL LETTER ABKHASIAN HA
04A9	ҩ	HELD AL W S	CYRILLIC SMALL LETTER ABKHASIAN HA
04AA	Ҫ	HELD AU W C	CYRILLIC CAPITAL LETTER ES WITH DESCENDER
04AB	ҫ	HELD AL W C	CYRILLIC SMALL LETTER ES WITH DESCENDER
04AC	Ҭ	HELD AU W T	CYRILLIC CAPITAL LETTER TE WITH DESCENDER
04AD	ҭ	HELD AL W T	CYRILLIC SMALL LETTER TE WITH DESCENDER
04AE	Ү	HELD AU \ Y	CYRILLIC CAPITAL LETTER STRAIGHT U
04AF	ү	HELD AL \ Y	CYRILLIC SMALL LETTER STRAIGHT U
04B0	Ұ	HELD AU - Y	CYRILLIC CAPITAL LETTER STRAIGHT U WITH STROKE
04B1	ұ	HELD AL - Y	CYRILLIC SMALL LETTER STRAIGHT U WITH STROKE
04B2	Ҳ	HELD AU W X	CYRILLIC CAPITAL LETTER HA WITH DESCENDER
04B3	ҳ	HELD AL W X	CYRILLIC SMALL LETTER HA WITH DESCENDER

04B4	Ҵ	HELD AU W D	CYRILLIC CAPITAL LIGATURE TE TSE
04B5	ҵ	HELD AL W D	CYRILLIC SMALL LIGATURE TE TSE
04B6	Ҷ	HELD AU W 4	CYRILLIC CAPITAL LETTER CHE WITH DESCENDER
04B7	ҷ	HELD AL W 4	CYRILLIC SMALL LETTER CHE WITH DESCENDER
04B8	Ҹ	HELD AU \ 4	CYRILLIC CAPITAL LETTER CHE WITH VERTICAL STROKE
04B9	ҹ	HELD AL \ 4	CYRILLIC SMALL LETTER CHE WITH VERTICAL STROKE
04BA	Һ	HELD AU 6 H	CYRILLIC CAPITAL LETTER SHHA
04BB	ҳ	HELD AL 6 H	CYRILLIC SMALL LETTER SHHA
04BC	Ҽ	DEAD AU W /	CYRILLIC CAPITAL LETTER ABKHASIAN CHE
04BD	ҽ	DEAD AL W /	CYRILLIC SMALL LETTER ABKHASIAN CHE
04BE	Ҿ	HELD AU W /	CYRILLIC CAPITAL LETTER ABKHASIAN CHE WITH DESCENDER
04BF	ҿ	HELD AL W /	CYRILLIC SMALL LETTER ABKHASIAN CHE WITH DESCENDER
04C0	Ӏ	HELD AU \ I	CYRILLIC CAPITAL LETTER PALOCHKA
04C1	Ӂ	DEAD AU W]	CYRILLIC CAPITAL LETTER ZHE WITH BREVE
04C2	ӂ	DEAD AL W]	CYRILLIC SMALL LETTER ZHE WITH BREVE
04C3	Ӄ	HELD AU W R	CYRILLIC CAPITAL LETTER KA WITH HOOK
04C4	ӄ	HELD AL W R	CYRILLIC SMALL LETTER KA WITH HOOK
04C5	Ӆ	HELD AU 6 L	CYRILLIC CAPITAL LETTER EL WITH TAIL
04C6	ӆ	HELD AL 6 L	CYRILLIC SMALL LETTER EL WITH TAIL
04C7	Ӈ	HELD AU W J	CYRILLIC CAPITAL LETTER EN WITH HOOK
04C8	ӈ	HELD AL W J	CYRILLIC SMALL LETTER EN WITH HOOK
04C9	Ӊ	HELD AU , H	CYRILLIC CAPITAL LETTER EN WITH TAIL
04CA	ӊ	HELD AL , H	CYRILLIC SMALL LETTER EN WITH TAIL
04CB	Ӌ	DEAD AU 6 4	CYRILLIC CAPITAL LETTER KHAKASSIAN CHE
04CC	ӌ	DEAD AL 6 4	CYRILLIC SMALL LETTER KHAKASSIAN CHE
04CD	Ӎ	HELD AU W M	CYRILLIC CAPITAL LETTER EM WITH TAIL
04CE	ӎ	HELD AL W M	CYRILLIC SMALL LETTER EM WITH TAIL
04CF	ӏ	HELD AL \ I	CYRILLIC SMALL LETTER PALOCHKA
04D0	Ӑ	HELD AU 6 A	CYRILLIC CAPITAL LETTER A WITH BREVE
04D1	ӑ	HELD AL 6 A	CYRILLIC SMALL LETTER A WITH BREVE
04D2	Ӓ	HELD AU W A	CYRILLIC CAPITAL LETTER A WITH DIAERESIS
04D3	ӓ	HELD AL W A	CYRILLIC SMALL LETTER A WITH DIAERESIS
04D4	Ӕ	HELD AU 6 Q	CYRILLIC CAPITAL LIGATURE A IE
04D5	ӕ	HELD AL 6 Q	CYRILLIC SMALL LIGATURE A IE

04D6	Ĕ	HELD AU 6 E	CYRILLIC CAPITAL LETTER IE WITH BREVE
04D7	ĕ	HELD AL 6 E	CYRILLIC SMALL LETTER IE WITH BREVE
04D8	Ə	DEAD AU W G	CYRILLIC CAPITAL LETTER SCHWA
04D9	ə	DEAD AL W G	CYRILLIC SMALL LETTER SCHWA
04DA	Ӓ	HELD AU W G	CYRILLIC CAPITAL LETTER SCHWA WITH DIAERESIS
04DB	ӓ	HELD AL W G	CYRILLIC SMALL LETTER SCHWA WITH DIAERESIS
04DC	Ӝ	HELD AU W]	CYRILLIC CAPITAL LETTER ZHE WITH DIAERESIS
04DD	ӝ	HELD AL W]	CYRILLIC SMALL LETTER ZHE WITH DIAERESIS
04DE	Ӟ	HELD AU W 3	CYRILLIC CAPITAL LETTER ZE WITH DIAERESIS
04DF	ӟ	HELD AL W 3	CYRILLIC SMALL LETTER ZE WITH DIAERESIS
04E0	Ꙁ	HELD AU 6 3	CYRILLIC CAPITAL LETTER ABKHASIAN DZE
04E1	ꙁ	HELD AL 6 3	CYRILLIC SMALL LETTER ABKHASIAN DZE
04E2	Ӣ	HELD AU = N	CYRILLIC CAPITAL LETTER I WITH MACRON
04E3	ӣ	HELD AL = N	CYRILLIC SMALL LETTER I WITH MACRON
04E4	Ӥ	HELD AU W N	CYRILLIC CAPITAL LETTER I WITH DIAERESIS
04E5	ӥ	HELD AL W N	CYRILLIC SMALL LETTER I WITH DIAERESIS
04E6	Ӧ	HELD AU W O	CYRILLIC CAPITAL LETTER O WITH DIAERESIS
04E7	ӧ	HELD AL W O	CYRILLIC SMALL LETTER O WITH DIAERESIS
04E8	Ө	DEAD AU W Q	CYRILLIC CAPITAL LETTER BARRED O
04E9	ө	DEAD AL W Q	CYRILLIC SMALL LETTER BARRED O
04EA	Ӧ	HELD AU W Q	CYRILLIC CAPITAL LETTER BARRED O WITH DIAERESIS
04EB	ӧ	HELD AL W Q	CYRILLIC SMALL LETTER BARRED O WITH DIAERESIS
04EC	Ӭ	HELD AU W 2	CYRILLIC CAPITAL LETTER E WITH DIAERESIS
04ED	ӭ	HELD AL W 2	CYRILLIC SMALL LETTER E WITH DIAERESIS
04EE	Ӯ	HELD AU = Y	CYRILLIC CAPITAL LETTER U WITH MACRON
04EF	ӯ	HELD AL = Y	CYRILLIC SMALL LETTER U WITH MACRON
04F0	Ӱ	HELD AU W Y	CYRILLIC CAPITAL LETTER U WITH DIAERESIS
04F1	ӱ	HELD AL W Y	CYRILLIC SMALL LETTER U WITH DIAERESIS
04F2	Ӳ	HELD AU ' Y	CYRILLIC CAPITAL LETTER U WITH DOUBLE ACUTE
04F3	ӳ	HELD AL ' Y	CYRILLIC SMALL LETTER U WITH DOUBLE ACUTE
04F4	Ӵ	HELD AU 6 4	CYRILLIC CAPITAL LETTER CHE WITH DIAERESIS
04F5	ӵ	HELD AL 6 4	CYRILLIC SMALL LETTER CHE WITH DIAERESIS
04F6	Ҕ	HELD AU W 7	CYRILLIC CAPITAL LETTER GHE WITH DESCENDER
04F7	ҕ	HELD AL W 7	CYRILLIC SMALL LETTER GHE WITH DESCENDER

04F8	Ӹ	HELD AU 6 1	CYRILLIC CAPITAL LETTER YERU WITH DIAERESIS
04F9	ӹ	HELD AL 6 1	CYRILLIC SMALL LETTER YERU WITH DIAERESIS
04FA	Ғ	HELD AU W F	CYRILLIC CAPITAL LETTER GHE WITH STROKE AND HOOK
04FB	ғ	HELD AL W F	CYRILLIC SMALL LETTER GHE WITH STROKE AND HOOK
04FC	Ҳ	HELD AU , X	CYRILLIC CAPITAL LETTER HA WITH HOOK
04FD	ҳ	HELD AL , X	CYRILLIC SMALL LETTER HA WITH HOOK
04FE	Ӿ	HELD AU - X	CYRILLIC CAPITAL LETTER HA WITH STROKE
04FF	ӿ	HELD AL - X	CYRILLIC SMALL LETTER HA WITH STROKE
0500	Ԁ	DEAD AU 5 D	CYRILLIC CAPITAL LETTER KOMI DE
0501	ԁ	DEAD AL 5 D	CYRILLIC SMALL LETTER KOMI DE
0502	Ԅ	HELD AU 5 D	CYRILLIC CAPITAL LETTER KOMI DJE
0503	ԅ	HELD AL 5 D	CYRILLIC SMALL LETTER KOMI DJE
0504	Ԇ	DEAD AU 5 R	CYRILLIC CAPITAL LETTER KOMI ZJE
0505	ԇ	DEAD AL 5 R	CYRILLIC SMALL LETTER KOMI ZJE
0506	Ԉ	HELD AU 5 R	CYRILLIC CAPITAL LETTER KOMI DZJE
0507	ԉ	HELD AL 5 R	CYRILLIC SMALL LETTER KOMI DZJE
0508	Ԋ	HELD AU 5 L	CYRILLIC CAPITAL LETTER KOMI LJE
0509	ԋ	HELD AL 5 L	CYRILLIC SMALL LETTER KOMI LJE
050A	Ԍ	HELD AU 5 H	CYRILLIC CAPITAL LETTER KOMI NJE
050B	ԍ	HELD AL 5 H	CYRILLIC SMALL LETTER KOMI NJE
050C	Ԏ	HELD AU 5 G	CYRILLIC CAPITAL LETTER KOMI SJE
050D	ԏ	HELD AL 5 G	CYRILLIC SMALL LETTER KOMI SJE
050E	Ԑ	HELD AU 5 T	CYRILLIC CAPITAL LETTER KOMI TJE
050F	ԑ	HELD AL 5 T	CYRILLIC SMALL LETTER KOMI TJE
0510	Ԓ	HELD AU 6 2	CYRILLIC CAPITAL LETTER REVERSED ZE
0511	ԓ	HELD AL 6 2	CYRILLIC SMALL LETTER REVERSED ZE
0512	Ԕ	DEAD AU 6 L	CYRILLIC CAPITAL LETTER EL WITH HOOK
0513	ԕ	DEAD AL 6 L	CYRILLIC SMALL LETTER EL WITH HOOK
0514	Ԗ	HELD AU \ X	CYRILLIC CAPITAL LETTER LHA
0515	ԗ	HELD AL \ X	CYRILLIC SMALL LETTER LHA
0516	Ԙ	HELD AU 6 P	CYRILLIC CAPITAL LETTER RHA
0517	ԙ	HELD AL 6 P	CYRILLIC SMALL LETTER RHA
0518	Ԛ	HELD AU \ R	CYRILLIC CAPITAL LETTER YAE
0519	ԛ	HELD AL \ R	CYRILLIC SMALL LETTER YAE

051A	Ԛ	HELD AU 5 Q	CYRILLIC CAPITAL LETTER QA
051B	ԛ	HELD AL 5 Q	CYRILLIC SMALL LETTER QA
051C	Ԝ	HELD AU 5 W	CYRILLIC CAPITAL LETTER WE
051D	ԝ	HELD AL 5 W	CYRILLIC SMALL LETTER WE
051E	Ҡ	HELD AU 5 K	CYRILLIC CAPITAL LETTER ALEUT KA
051F	ҡ	HELD AL 5 K	CYRILLIC SMALL LETTER ALEUT KA
0520	Ԥ	HELD AU . L	CYRILLIC CAPITAL LETTER EL WITH MIDDLE HOOK
0521	ԥ	HELD AL . L	CYRILLIC SMALL LETTER EL WITH MIDDLE HOOK
0522	Ԧ	HELD AU . H	CYRILLIC CAPITAL LETTER EN WITH MIDDLE HOOK
0523	ԧ	HELD AL . H	CYRILLIC SMALL LETTER EN WITH MIDDLE HOOK
0524	Ԥ̣	HELD AU W V	CYRILLIC CAPITAL LETTER PE WITH DESCENDER
0525	ԥ̣	HELD AL W V	CYRILLIC SMALL LETTER PE WITH DESCENDER
0526	Ԧ̣	DEAD AU 7 H	CYRILLIC CAPITAL LETTER SHHA WITH DESCENDER
0527	ԧ̣	DEAD AL 7 H	CYRILLIC SMALL LETTER SHHA WITH DESCENDER
0528	Ԩ	HELD AU 6 J	CYRILLIC CAPITAL LETTER EN WITH LEFT HOOK
0529	ԩ	HELD AL 6 J	CYRILLIC SMALL LETTER EN WITH LEFT HOOK
052E	Ԥ̣	HELD AU W L	CYRILLIC CAPITAL LETTER EL WITH DESCENDER
052F	ԥ̣	HELD AL W L	CYRILLIC SMALL LETTER EL WITH DESCENDER
058F		HELD AL [A	ARMENIAN DRAM SIGN
060B	؋	HELD AL] W	AFGHANI CURRENCY SIGN
061C		AL X CL A	ARABIC LETTER MARK
09F2	৲	HELD AL] \	BENGALI RUPEE MARK
09F3	৳	HELD AL] B	BANGLADESHI TAKA, BENGALI RUPEE
0AF1	૱	HELD AL] Q	GUJARATI CURRENCY: RUPEE SIGN
0BF9		HELD AL] Z	TAMIL CURRENCY: RUPEE SIGN
0CB0	ರ	HELD AL [O	KANNADA CURRENCY: LETTER RA
0DD4	෴	HELD AL] O	SINHALA CURRENCY: VOWEL SIGN KETTI PAA-PILLA
0E3F	฿	HELD AL / B	THAI CURRENCY SYMBOL BAHT

Range U+1000 to U+1FFF

U+	Sym	Key Sequence	Description
10FB	։	HELD AL = 3	GEORGIAN PARAGRAPH SEPARATOR
17DB		HELD AL [Q	CAMBODIAN KHMER CURRENCY SYMBOL RIEL
1D00	ᴀ	HELD AL X A	LATIN LETTER SMALL CAPITAL A
1D01	ᴁ	HELD AU X Q	LATIN LETTER SMALL CAPITAL AE
1D03	ᴃ	HELD AL - B	LATIN LETTER SMALL CAPITAL BARRED B
1D04	ᴄ	HELD AL X C	LATIN LETTER SMALL CAPITAL C
1D05	ᴅ	HELD AL X D	LATIN LETTER SMALL CAPITAL D
1D06	ᴆ	HELD AL - D	LATIN LETTER SMALL CAPITAL ETH
1D07	ᴇ	HELD AL X E	LATIN LETTER SMALL CAPITAL E
1D09	ᴉ	DEAD AL 0 J	LATIN SMALL LETTER TURNED I
1D0A	ᴊ	HELD AL X J	LATIN LETTER SMALL CAPITAL J
1D0B	ᴋ	HELD AL X K	LATIN LETTER SMALL CAPITAL K
1D0C	ᴌ	HELD AL / L	LATIN LETTER SMALL CAPITAL L WITH STROKE
1D0D	ᴍ	HELD AL X M	LATIN LETTER SMALL CAPITAL M
1D0E	ᴎ	HELD AL \ N	LATIN LETTER SMALL CAPITAL REVERSED N
1D0F	ᴏ	HELD AL X O	LATIN LETTER SMALL CAPITAL O
1D10	ᴐ	HELD AL \ C	LATIN LETTER SMALL CAPITAL OPEN O
1D18	ᴘ	HELD AL X P	LATIN LETTER SMALL CAPITAL P
1D19	ᴙ	DEAD AL 6 R	LATIN LETTER SMALL CAPITAL REVERSED R
1D1A	ᴚ	DEAD AU 0 R	LATIN LETTER SMALL CAPITAL TURNED R
1D1B	ᴛ	HELD AL X T	LATIN LETTER SMALL CAPITAL T
1D1C	ᴜ	HELD AL X U	LATIN LETTER SMALL CAPITAL U
1D20	ᴠ	HELD AL X V	LATIN LETTER SMALL CAPITAL V
1D21	ᴡ	HELD AL X W	LATIN LETTER SMALL CAPITAL W
1D22	ᴢ	HELD AL X Z	LATIN LETTER SMALL CAPITAL Z
1D2C	ᴬ	HELD AU M A	MODIFIER LETTER CAPITAL A
1D2E	ᴮ	HELD AU M B	MODIFIER LETTER CAPITAL B
1D30	ᴰ	HELD AU M D	MODIFIER LETTER CAPITAL D
1D31	ᴱ	HELD AU M E	MODIFIER LETTER CAPITAL E
1D33	ᴳ	HELD AU M G	MODIFIER LETTER CAPITAL G
1D34	ᴴ	HELD AU M H	MODIFIER LETTER CAPITAL H

1D35	ᴵ	HELD AU M I	MODIFIER LETTER CAPITAL I
1D36	ᴶ	HELD AU M J	MODIFIER LETTER CAPITAL J
1D37	ᴷ	HELD AU M K	MODIFIER LETTER CAPITAL K
1D38	ᴸ	HELD AU M L	MODIFIER LETTER CAPITAL L
1D39	ᴹ	HELD AU M M	MODIFIER LETTER CAPITAL M
1D3A	ᴺ	HELD AU M N	MODIFIER LETTER CAPITAL N
1D3C	ᴼ	HELD AU M O	MODIFIER LETTER CAPITAL O
1D3E	ᴾ	HELD AU M P	MODIFIER LETTER CAPITAL P
1D3F	ᴿ	HELD AU M R	MODIFIER LETTER CAPITAL R
1D40	ᵀ	HELD AU M T	MODIFIER LETTER CAPITAL T
1D41	ᵁ	HELD AU M U	MODIFIER LETTER CAPITAL U
1D42	ᵂ	HELD AU M W	MODIFIER LETTER CAPITAL W
1D43	ᵃ	HELD AL M A	MODIFIER LETTER SMALL A
1D45	ᵅ	HELD AL M Q	MODIFIER LETTER SMALL ALPHA
1D47	ᵇ	HELD AL M B	MODIFIER LETTER SMALL B
1D48	ᵈ	HELD AL M D	MODIFIER LETTER SMALL D
1D49	ᵉ	HELD AL M E	MODIFIER LETTER SMALL E
1D49	ᵉ	LIVE AC E	MODIFIER LETTER SMALL E
1D4A	ᵊ	HELD AL M `	MODIFIER LETTER SMALL SCHWA
1D4B	ᵋ	HELD AL M [	MODIFIER LETTER SMALL OPEN E
1D4D	ᵍ	HELD AL M G	MODIFIER LETTER SMALL G
1D4E	ᵎ	HELD AL 0 J	MODIFIER LETTER SMALL TURNED I
1D4F	ᵏ	HELD AL M K	MODIFIER LETTER SMALL K
1D50	ᵐ	HELD AL M M	MODIFIER LETTER SMALL M
1D51	ᵑ	HELD AU 9 N	MODIFIER LETTER SMALL ENG
1D52	ᵒ	HELD AL M O	MODIFIER LETTER SMALL O
1D53	ᵓ	HELD AL M]	MODIFIER LETTER SMALL OPEN O
1D54	ᵔ	DEAD AL 9 SP	MODIFIER LETTER SMALL TOP HALF O
1D55	ᵕ	AL 0 BL 0	MODIFIER LETTER SMALL BOTTOM HALF O
1D56	ᵖ	HELD AL M P	MODIFIER LETTER SMALL P
1D57	ᵗ	HELD AL M T	MODIFIER LETTER SMALL T
1D58	ᵘ	HELD AL M U	MODIFIER LETTER SMALL U
1D5B	ᵛ	HELD AL M V	MODIFIER LETTER SMALL V
1D5D	ᵝ	DEAD AL 9 B	MODIFIER LETTER SMALL BETA

1D5E	ᵞ	*HELD AL 4 G*	MODIFIER LETTER SMALL GREEK GAMMA
1D5F	ᵟ	*HELD AL 9 D*	MODIFIER LETTER SMALL DELTA
1D60	ᵠ	*HELD AL 4 0*	MODIFIER LETTER SMALL GREEK PHI
1D61	ᵡ	*HELD AL 4 X*	MODIFIER LETTER SMALL CHI
1D62	ᵢ	*HELD AL 9 I*	LATIN SUBSCRIPT SMALL LETTER I
1D63	ᵣ	*HELD AL 9 R*	LATIN SUBSCRIPT SMALL LETTER R
1D64	ᵤ	*HELD AL 9 U*	LATIN SUBSCRIPT SMALL LETTER U
1D65	ᵥ	*HELD AL 9 V*	LATIN SUBSCRIPT SMALL LETTER V
1D66	ᵦ	*HELD AL 9 B*	GREEK SUBSCRIPT SMALL LETTER BETA
1D67	ᵧ	*HELD AL 9 G*	GREEK SUBSCRIPT SMALL LETTER GAMMA
1D68	ᵨ	DEAD AL 9 P	GREEK SUBSCRIPT SMALL LETTER RHO
1D69	ᵩ	*HELD AL 9 F*	GREEK SUBSCRIPT SMALL LETTER PHI
1D6A	ᵪ	DEAD AL 9 X	GREEK SUBSCRIPT SMALL LETTER CHI
1D6B	ᵫ	*HELD AL 8 U*	LATIN SMALL LETTER UE
1D6C	ᵬ	DEAD AL 2 B	LATIN SMALL LETTER B WITH MIDDLE TILDE
1D6D	ᵭ	DEAD AL 2 D	LATIN SMALL LETTER D WITH MIDDLE TILDE
1D6E	ᵮ	DEAD AL 2 F	LATIN SMALL LETTER F WITH MIDDLE TILDE
1D6F	ᵯ	DEAD AL 2 M	LATIN SMALL LETTER M WITH MIDDLE TILDE
1D70	ᵰ	DEAD AL 2 N	LATIN SMALL LETTER N WITH MIDDLE TILDE
1D71	ᵱ	DEAD AL 2 P	LATIN SMALL LETTER P WITH MIDDLE TILDE
1D72	ᵲ	DEAD AL 2 R	LATIN SMALL LETTER R WITH MIDDLE TILDE
1D74	ᵴ	DEAD AL 2 S	LATIN SMALL LETTER S WITH MIDDLE TILDE
1D75	ᵵ	DEAD AL 2 T	LATIN SMALL LETTER T WITH MIDDLE TILDE
1D76	ᵶ	DEAD AL 2 Z	LATIN SMALL LETTER Z WITH MIDDLE TILDE
1D77	ᵷ	DEAD AL 3 G	LATIN SMALL LETTER TURNED G
1D78	ᵸ	*HELD AL = H*	MODIFIER LETTER CYRILLIC EN
1D79	ᵹ	DEAD AL 8 G	LATIN SMALL LETTER INSULAR G
1D7A	ᵺ	DEAD AL / H	LATIN SMALL LETTER TH WITH STRIKETHROUGH
1D7B	ᵻ	DEAD AL M I	LATIN SMALL CAPITAL LETTER I WITH STROKE
1D7C	ᵼ	*HELD AL - I*	LATIN SMALL LETTER IOTA WITH STROKE
1D7D	ᵽ	DEAD AL - P	LATIN SMALL LETTER P WITH STROKE
1D7E	ᵾ	*HELD AL - U*	LATIN SMALL CAPITAL LETTER U WITH STROKE
1D7F	ᵿ	*HELD AU - U*	LATIN SMALL LETTER UPSILON WITH STROKE
1D80	ᶀ	*HELD AL 0 B*	LATIN SMALL LETTER B WITH PALATAL HOOK

1D81	ᶑ	HELD AL 0 D	LATIN SMALL LETTER D WITH PALATAL HOOK
1D82	ᶒ	HELD AL 0 F	LATIN SMALL LETTER F WITH PALATAL HOOK
1D83	ᶜ	HELD AL 0 G	LATIN SMALL LETTER G WITH PALATAL HOOK
1D84	ᶓ	HELD AL 0 K	LATIN SMALL LETTER K WITH PALATAL HOOK
1D85	ᶔ	HELD AL 0 L	LATIN SMALL LETTER L WITH PALATAL HOOK
1D86	ᶝ	HELD AL 0 M	LATIN SMALL LETTER M WITH PALATAL HOOK
1D87	ᶖ	HELD AL 0 N	LATIN SMALL LETTER N WITH PALATAL HOOK
1D88	ᶗ	HELD AL 0 P	LATIN SMALL LETTER P WITH PALATAL HOOK
1D89	ᶘ	HELD AL 0 R	LATIN SMALL LETTER R WITH PALATAL HOOK
1D8A	ᶙ	HELD AL 0 S	LATIN SMALL LETTER S WITH PALATAL HOOK
1D8B	ᶚ	DEAD AL 0 S	LATIN SMALL LETTER ESH WITH PALATAL HOOK
1D8C	ᶛ	HELD AL 0 V	LATIN SMALL LETTER V WITH PALATAL HOOK
1D8D	ᶜ	HELD AL 0 X	LATIN SMALL LETTER X WITH PALATAL HOOK
1D8E	ᶜ	HELD AL 0 Z	LATIN SMALL LETTER Z WITH PALATAL HOOK
1D8F	ᶏ	HELD AL 7 A	LATIN SMALL LETTER A WITH RETROFLEX HOOK
1D90	ᶐ	HELD AL 0 A	LATIN SMALL LETTER ALPHA WITH RETROFLEX HOOK
1D91	ᶑ	HELD AL 7 D	LATIN SMALL LETTER D WITH HOOK AND TAIL
1D92	ᶒ	HELD AL 7 E	LATIN SMALL LETTER E WITH RETROFLEX HOOK
1D93	ᶓ	HELD AL 0 E	LATIN SMALL LETTER OPEN E WITH RETROFLEX HOOK
1D94	ᶔ	HELD AL 7 3	LATIN SMALL LETTER REVERSED OPEN E WITH RETROFLEX HOOK
1D95	ᶕ	HELD AL 7 `	LATIN SMALL LETTER SCHWA WITH RETROFLEX HOOK
1D96	ᶖ	HELD AL 7 I	LATIN SMALL LETTER I WITH RETROFLEX HOOK
1D97	ᶗ	HELD AL 7 O	LATIN SMALL LETTER OPEN O WITH RETROFLEX HOOK
1D98	ᶘ	DEAD AL 7 S	LATIN SMALL LETTER ESH WITH RETROFLEX HOOK
1D99	ᶙ	HELD AL 7 U	LATIN SMALL LETTER U WITH RETROFLEX HOOK
1D9A	ᶚ	DEAD AL 7 3	LATIN SMALL LETTER EZH WITH RETROFLEX HOOK
1D9C	ᶜ	HELD AL M C	MODIFIER LETTER SMALL C
1D9E	ᶞ	HELD AU 9 D	MODIFIER LETTER SMALL ETH
1D9F	ᶟ	HELD AL M \	MODIFIER LETTER SMALL REVERSED OPEN E
1DA0	ᶠ	HELD AL M F	MODIFIER LETTER SMALL F
1DA2	ᶢ	HELD AU 9 G	MODIFIER LETTER SMALL SCRIPT G
1DAC	ᶬ	HELD AU X M	MODIFIER LETTER SMALL M WITH HOOK
1DAE	ᶮ	HELD AU X N	MODIFIER LETTER SMALL N WITH LEFT HOOK
1DAF	ᶯ	HELD AU 7 N	MODIFIER LETTER SMALL N WITH RETROFLEX HOOK

1DB0	ᴺ	*HELD AU \ N*	MODIFIER LETTER SMALL CAPITAL N
1DB2	ᶲ	*HELD AL 4 F*	MODIFIER LETTER SMALL PHI
1DB3	ˢ	*HELD AU 9 S*	MODIFIER LETTER SMALL S WITH HOOK
1DB7	ᵚ	*HELD AL 9 Y*	MODIFIER LETTER SMALL UPSILON
1DBB	ᶻ	*HELD AL M Z*	MODIFIER LETTER SMALL Z
1DBF	ᶿ	*HELD AL 4 U*	MODIFIER LETTER SMALL THETA
1DC4	◌ᷔ	*HELD AL - /*	COMBINING MACRON-ACUTE
1DC5	◌ᷕ	*HELD AL \ -*	COMBINING GRAVE-MACRON
1DC6	◌ᷖ	*HELD AL - *	COMBINING MACRON-GRAVE
1DC7	◌ᷗ	*HELD AL / -*	COMBINING ACUTE-MACRON
1DC8	◌ᷘ	*HELD AL ` '*	COMBINING GRAVE-ACUTE-GRAVE
1DC9	◌ᷙ	*HELD AL ' `*	COMBINING ACUTE-GRAVE-ACUTE
1DCA	◌ᷚ	*HELD AL ` R*	COMBINING LATIN SMALL LETTER R BELOW
1DCB	◌ᷛ	DEAD AL 0 =	COMBINING BREVE-MACRON
1DCC	◌ᷜ	DEAD AL = 0	COMBINING MACRON-BREVE
1DCD	◌᷍	*HELD AU 6 6*	COMBINING DOUBLE CIRCUMFLEX ABOVE
1DCE	◌᷎	DEAD AL 5 5	COMBINING OGONEK ABOVE
1DD8	◌᷏	*HELD AU 8 D*	COMBINING LATIN SMALL LETTER INSULAR D
1DFE	◌᷾	DEAD AL ; ,	COMBINING LEFT ARROWHEAD ABOVE
1E00	Ḁ	*HELD AU 8 A*	LATIN CAPITAL LETTER A WITH RING BELOW
1E01	ḁ	*HELD AL 8 A*	LATIN SMALL LETTER A WITH RING BELOW
1E02	Ḃ	DEAD AU . B	LATIN CAPITAL LETTER B WITH DOT ABOVE
1E03	ḃ	DEAD AL . B	LATIN SMALL LETTER B WITH DOT ABOVE
1E04	Ḅ	DEAD AU \ B	LATIN CAPITAL LETTER B WITH DOT BELOW
1E05	ḅ	DEAD AL \ B	LATIN SMALL LETTER B WITH DOT BELOW
1E06	Ḇ	DEAD AU = B	LATIN CAPITAL LETTER B WITH LINE BELOW
1E07	ḇ	DEAD AL = B	LATIN SMALL LETTER B WITH LINE BELOW
1E08	Ḉ	*HELD AU , C*	LATIN CAPITAL LETTER C WITH CEDILLA AND ACUTE
1E09	ḉ	*HELD AL , C*	LATIN SMALL LETTER C WITH CEDILLA AND ACUTE
1E0A	Ḋ	DEAD AU . D	LATIN CAPITAL LETTER D WITH DOT ABOVE
1E0B	ḋ	DEAD AL . D	LATIN SMALL LETTER D WITH DOT ABOVE
1E0C	Ḍ	DEAD AU \ D	LATIN CAPITAL LETTER D WITH DOT BELOW
1E0D	ḍ	DEAD AL \ D	LATIN SMALL LETTER D WITH DOT BELOW
1E0E	Ḏ	DEAD AU = D	LATIN CAPITAL LETTER D WITH LINE BELOW
1E0F	ḏ	DEAD AL = D	LATIN SMALL LETTER D WITH LINE BELOW

1E10	Ḑ	DEAD AU , D	LATIN CAPITAL LETTER D WITH CEDILLA
1E11	ḑ	DEAD AL , D	LATIN SMALL LETTER D WITH CEDILLA
1E12	Ḍ	DEAD AU [D	LATIN CAPITAL LETTER D WITH CIRCUMFLEX BELOW
1E13	ḍ	DEAD AL [D	LATIN SMALL LETTER D WITH CIRCUMFLEX BELOW
1E14	Ḕ	*HELD AU = E*	LATIN CAPITAL LETTER E WITH MACRON AND GRAVE
1E15	ḕ	*HELD AL = E*	LATIN SMALL LETTER E WITH MACRON AND GRAVE
1E16	Ḗ	*HELD AU ' E*	LATIN CAPITAL LETTER E WITH MACRON AND ACUTE
1E17	ḗ	*HELD AL ' E*	LATIN SMALL LETTER E WITH MACRON AND ACUTE
1E18	Ḙ	DEAD AU [E	LATIN CAPITAL LETTER E WITH CIRCUMFLEX BELOW
1E19	ḙ	DEAD AL [E	LATIN SMALL LETTER E WITH CIRCUMFLEX BELOW
1E1A	Ḛ	DEAD AU 2 E	LATIN CAPITAL LETTER E WITH TILDE BELOW
1E1B	ḛ	DEAD AL 2 E	LATIN SMALL LETTER E WITH TILDE BELOW
1E1C	Ḝ	*HELD AU , E*	LATIN CAPITAL LETTER E WITH CEDILLA AND BREVE
1E1D	ḝ	*HELD AL , E*	LATIN SMALL LETTER E WITH CEDILLA AND BREVE
1E1E	Ḟ	DEAD AU . F	LATIN CAPITAL LETTER F WITH DOT ABOVE
1E1F	ḟ	DEAD AL . F	LATIN SMALL LETTER F WITH DOT ABOVE
1E20	Ḡ	DEAD AU = G	LATIN CAPITAL LETTER G WITH MACRON
1E21	ḡ	DEAD AL = G	LATIN SMALL LETTER G WITH MACRON
1E22	Ḣ	DEAD AU . H	LATIN CAPITAL LETTER H WITH DOT ABOVE
1E23	ḣ	DEAD AL . H	LATIN SMALL LETTER H WITH DOT ABOVE
1E24	Ḥ	DEAD AU \ H	LATIN CAPITAL LETTER H WITH DOT BELOW
1E25	ḥ	DEAD AL \ H	LATIN SMALL LETTER H WITH DOT BELOW
1E26	Ḧ	DEAD AU ; H	LATIN CAPITAL LETTER H WITH DIAERESIS
1E27	ḧ	DEAD AL ; H	LATIN SMALL LETTER H WITH DIAERESIS
1E28	Ḩ	DEAD AU , H	LATIN CAPITAL LETTER H WITH CEDILLA
1E29	ḩ	DEAD AL , H	LATIN SMALL LETTER H WITH CEDILLA
1E2A	Ḫ	DEAD AU 0 H	LATIN CAPITAL LETTER H WITH BREVE BELOW
1E2B	ḫ	DEAD AL 0 H	LATIN SMALL LETTER H WITH BREVE BELOW
1E2C	Ḭ	DEAD AU 2 I	LATIN CAPITAL LETTER I WITH TILDE BELOW
1E2D	ḭ	DEAD AL 2 I	LATIN SMALL LETTER I WITH TILDE BELOW
1E2E	Ḯ	*HELD AU ; I*	LATIN CAPITAL LETTER I WITH DIAERESIS AND ACUTE
1E2F	ḯ	*HELD AL ; I*	LATIN SMALL LETTER I WITH DIAERESIS AND ACUTE
1E30	Ḱ	DEAD AU ' K	LATIN CAPITAL LETTER K WITH ACUTE
1E31	ḱ	DEAD AL ' K	LATIN SMALL LETTER K WITH ACUTE

1E32	Ḳ	DEAD AU . K	LATIN CAPITAL LETTER K WITH DOT BELOW
1E32	Ḳ	DEAD AU \ K	LATIN CAPITAL LETTER K WITH DOT BELOW
1E33	ḳ	DEAD AL . K	LATIN SMALL LETTER K WITH DOT BELOW
1E33	ḳ	DEAD AL \ K	LATIN SMALL LETTER K WITH DOT BELOW
1E34	Ḵ	DEAD AU = K	LATIN CAPITAL LETTER K WITH LINE BELOW
1E35	ḵ	DEAD AL = K	LATIN SMALL LETTER K WITH LINE BELOW
1E36	Ḷ	DEAD AU \ L	LATIN CAPITAL LETTER L WITH DOT BELOW
1E37	ḷ	DEAD AL \ L	LATIN SMALL LETTER L WITH DOT BELOW
1E38	Ḹ	*HELD AU = L*	LATIN CAPITAL LETTER L WITH DOT BELOW AND MACRON
1E39	ḹ	*HELD AL = L*	LATIN SMALL LETTER L WITH DOT BELOW AND MACRON
1E3A	Ḻ	DEAD AU = L	LATIN CAPITAL LETTER L WITH LINE BELOW
1E3B	ḻ	DEAD AL = L	LATIN SMALL LETTER L WITH LINE BELOW
1E3C	Ḽ	DEAD AU [L	LATIN CAPITAL LETTER L WITH CIRCUMFLEX BELOW
1E3D	ḽ	DEAD AL [L	LATIN SMALL LETTER L WITH CIRCUMFLEX BELOW
1E3E	Ḿ	DEAD AU ' M	LATIN CAPITAL LETTER M WITH ACUTE
1E3F	ḿ	DEAD AL ' M	LATIN SMALL LETTER M WITH ACUTE
1E40	Ṁ	DEAD AU . M	LATIN CAPITAL LETTER M WITH DOT ABOVE
1E41	ṁ	DEAD AL . M	LATIN SMALL LETTER M WITH DOT ABOVE
1E42	Ṃ	DEAD AU \ M	LATIN CAPITAL LETTER M WITH DOT BELOW
1E43	ṃ	DEAD AL \ M	LATIN SMALL LETTER M WITH DOT BELOW
1E44	Ṅ	DEAD AU . N	LATIN CAPITAL LETTER N WITH DOT ABOVE
1E45	ṅ	DEAD AL . N	LATIN SMALL LETTER N WITH DOT ABOVE
1E46	Ṇ	DEAD AU \ N	LATIN CAPITAL LETTER N WITH DOT BELOW
1E47	ṇ	DEAD AL \ N	LATIN SMALL LETTER N WITH DOT BELOW
1E48	Ṉ	DEAD AU = N	LATIN CAPITAL LETTER N WITH LINE BELOW
1E49	ṉ	DEAD AL = N	LATIN SMALL LETTER N WITH LINE BELOW
1E4A	Ṋ	DEAD AU [N	LATIN CAPITAL LETTER N WITH CIRCUMFLEX BELOW
1E4B	ṋ	DEAD AL [N	LATIN SMALL LETTER N WITH CIRCUMFLEX BELOW
1E4C	Ṍ	*HELD AU 1 '*	LATIN CAPITAL LETTER O WITH TILDE AND ACUTE
1E4D	ṍ	*HELD AL 1 '*	LATIN SMALL LETTER O WITH TILDE AND ACUTE
1E4E	Ṏ	*HELD AU 1 ;*	LATIN CAPITAL LETTER O WITH TILDE AND DIAERESIS
1E4F	ṏ	*HELD AL 1 ;*	LATIN SMALL LETTER O WITH TILDE AND DIAERESIS
1E50	Ȍ	*HELD AU = O*	LATIN CAPITAL LETTER O WITH MACRON AND GRAVE
1E51	ȍ	*HELD AL = O*	LATIN SMALL LETTER O WITH MACRON AND GRAVE

1E52	Ṓ	*HELD AU ' O*	LATIN CAPITAL LETTER O WITH MACRON AND ACUTE
1E53	ṓ	*HELD AL ' O*	LATIN SMALL LETTER O WITH MACRON AND ACUTE
1E54	Ṕ	DEAD AU ' P	LATIN CAPITAL LETTER P WITH ACUTE
1E55	ṕ	DEAD AL ' P	LATIN SMALL LETTER P WITH ACUTE
1E56	Ṗ	DEAD AU . P	LATIN CAPITAL LETTER P WITH DOT ABOVE
1E57	ṗ	DEAD AL . P	LATIN SMALL LETTER P WITH DOT ABOVE
1E58	Ṙ	DEAD AU . R	LATIN CAPITAL LETTER R WITH DOT ABOVE
1E59	ṙ	DEAD AL . R	LATIN SMALL LETTER R WITH DOT ABOVE
1E5A	Ṛ	DEAD AU \ R	LATIN CAPITAL LETTER R WITH DOT BELOW
1E5B	ṛ	DEAD AL \ R	LATIN SMALL LETTER R WITH DOT BELOW
1E5C	Ṝ	*HELD AU = R*	LATIN CAPITAL LETTER R WITH DOT BELOW AND MACRON
1E5D	ṝ	*HELD AL = R*	LATIN SMALL LETTER R WITH DOT BELOW AND MACRON
1E5E	Ṟ	DEAD AU = R	LATIN CAPITAL LETTER R WITH LINE BELOW
1E5F	ṟ	DEAD AL = R	LATIN SMALL LETTER R WITH LINE BELOW
1E60	Ṡ	DEAD AU . S	LATIN CAPITAL LETTER S WITH DOT ABOVE
1E61	ṡ	DEAD AL . S	LATIN SMALL LETTER S WITH DOT ABOVE
1E62	Ṣ	DEAD AU \ S	LATIN CAPITAL LETTER S WITH DOT BELOW
1E63	ṣ	DEAD AL \ S	LATIN SMALL LETTER S WITH DOT BELOW
1E64	Ṥ	*HELD AU ' S*	LATIN CAPITAL LETTER S WITH ACUTE AND DOT ABOVE
1E65	ṥ	*HELD AL ' S*	LATIN SMALL LETTER S WITH ACUTE AND DOT ABOVE
1E66	Ṧ	*HELD AU] S*	LATIN CAPITAL LETTER S WITH CARON AND DOT ABOVE
1E67	ṧ	*HELD AL] S*	LATIN SMALL LETTER S WITH CARON AND DOT ABOVE
1E68	Ṩ	*HELD AU \ S*	LATIN CAPITAL LETTER S WITH DOT BELOW AND DOT ABOVE
1E69	ṩ	*HELD AL \ S*	LATIN SMALL LETTER S WITH DOT BELOW AND DOT ABOVE
1E6A	Ṫ	DEAD AU . T	LATIN CAPITAL LETTER T WITH DOT ABOVE
1E6B	ṫ	DEAD AL . T	LATIN SMALL LETTER T WITH DOT ABOVE
1E6C	Ṭ	DEAD AU \ T	LATIN CAPITAL LETTER T WITH DOT BELOW
1E6D	ṭ	DEAD AL \ T	LATIN SMALL LETTER T WITH DOT BELOW
1E6E	Ṯ	DEAD AU = T	LATIN CAPITAL LETTER T WITH LINE BELOW
1E6F	ṯ	DEAD AL = T	LATIN SMALL LETTER T WITH LINE BELOW
1E70	Ṱ	DEAD AU [T	LATIN CAPITAL LETTER T WITH CIRCUMFLEX BELOW
1E71	ṱ	DEAD AL [T	LATIN SMALL LETTER T WITH CIRCUMFLEX BELOW
1E72	Ṳ	*HELD AU ; U*	LATIN CAPITAL LETTER U WITH DIAERESIS BELOW
1E73	ṳ	*HELD AL ; U*	LATIN SMALL LETTER U WITH DIAERESIS BELOW

1E74	Ṵ	DEAD AU 2 U	LATIN CAPITAL LETTER U WITH TILDE BELOW
1E75	ṵ	DEAD AL 2 U	LATIN SMALL LETTER U WITH TILDE BELOW
1E76	Ṷ	DEAD AU [U	LATIN CAPITAL LETTER U WITH CIRCUMFLEX BELOW
1E77	ṷ	DEAD AL [U	LATIN SMALL LETTER U WITH CIRCUMFLEX BELOW
1E78	Ṹ	*HELD AU 1 U*	LATIN CAPITAL LETTER U WITH TILDE AND ACUTE
1E79	ṹ	*HELD AL 1 U*	LATIN SMALL LETTER U WITH TILDE AND ACUTE
1E7A	Ṻ	*HELD AU = ;*	LATIN CAPITAL LETTER U WITH MACRON AND DIAERESIS
1E7A	Ṻ	*HELD AU [U*	LATIN CAPITAL LETTER U WITH MACRON AND DIAERESIS
1E7B	ṻ	*HELD AL = ;*	LATIN SMALL LETTER U WITH MACRON AND DIAERESIS
1E7B	ṻ	*HELD AL [U*	LATIN SMALL LETTER U WITH MACRON AND DIAERESIS
1E7C	Ṽ	DEAD AU 1 V	LATIN CAPITAL LETTER V WITH TILDE
1E7D	ṽ	DEAD AL 1 V	LATIN SMALL LETTER V WITH TILDE
1E7E	Ṿ	DEAD AU . V	LATIN CAPITAL LETTER V WITH DOT BELOW
1E7E	Ṿ	DEAD AU \ V	LATIN CAPITAL LETTER V WITH DOT BELOW
1E7F	ṿ	DEAD AL . V	LATIN SMALL LETTER V WITH DOT BELOW
1E7F	ṿ	DEAD AL \ V	LATIN SMALL LETTER V WITH DOT BELOW
1E80	Ẁ	DEAD AU] W	LATIN CAPITAL LETTER W WITH GRAVE
1E80	Ẁ	DEAD AU ` W	LATIN CAPITAL LETTER W WITH GRAVE
1E81	ẁ	DEAD AL] W	LATIN SMALL LETTER W WITH GRAVE
1E81	ẁ	DEAD AL ` W	LATIN SMALL LETTER W WITH GRAVE
1E82	Ẃ	DEAD AU ' W	LATIN CAPITAL LETTER W WITH ACUTE
1E83	ẃ	DEAD AL ' W	LATIN SMALL LETTER W WITH ACUTE
1E84	Ẅ	DEAD AU ; W	LATIN CAPITAL LETTER W WITH DIAERESIS
1E84	Ẅ	LIVE BC Q	LATIN CAPITAL LETTER W WITH DIAERESIS
1E85	ẅ	DEAD AL ; W	LATIN SMALL LETTER W WITH DIAERESIS
1E85	ẅ	LIVE AB Q	LATIN SMALL LETTER W WITH DIAERESIS
1E86	Ẇ	DEAD AU . W	LATIN CAPITAL LETTER W WITH DOT ABOVE
1E87	ẇ	DEAD AL . W	LATIN SMALL LETTER W WITH DOT ABOVE
1E88	Ẉ	DEAD AU \ W	LATIN CAPITAL LETTER W WITH DOT BELOW
1E89	ẉ	DEAD AL \ W	LATIN SMALL LETTER W WITH DOT BELOW
1E8A	Ẋ	DEAD AU . X	LATIN CAPITAL LETTER X WITH DOT ABOVE
1E8A	Ẋ	LIVE BC X	LATIN CAPITAL LETTER X WITH DOT ABOVE
1E8B	ẋ	DEAD AL . X	LATIN SMALL LETTER X WITH DOT ABOVE
1E8B	ẋ	LIVE AB X	LATIN SMALL LETTER X WITH DOT ABOVE

1E8C	Ẍ	DEAD AU ; X	LATIN CAPITAL LETTER X WITH DIAERESIS
1E8D	ẍ	DEAD AL ; X	LATIN SMALL LETTER X WITH DIAERESIS
1E8E	Ẏ	DEAD AU . Y	LATIN CAPITAL LETTER Y WITH DOT ABOVE
1E8F	ẏ	DEAD AL . Y	LATIN SMALL LETTER Y WITH DOT ABOVE
1E90	Ẑ	DEAD AU 6 Z	LATIN CAPITAL LETTER Z WITH CIRCUMFLEX
1E91	ẑ	DEAD AL 6 Z	LATIN SMALL LETTER Z WITH CIRCUMFLEX
1E92	Ẓ	DEAD AU \ Z	LATIN CAPITAL LETTER Z WITH DOT BELOW
1E93	ẓ	DEAD AL \ Z	LATIN SMALL LETTER Z WITH DOT BELOW
1E94	Ẕ	DEAD AU = Z	LATIN CAPITAL LETTER Z WITH LINE BELOW
1E95	ẕ	DEAD AL = Z	LATIN SMALL LETTER Z WITH LINE BELOW
1E96	ẖ	DEAD AL = H	LATIN SMALL LETTER H WITH LINE BELOW
1E97	ẗ	DEAD AL ; T	LATIN SMALL LETTER T WITH DIAERESIS
1E98	ẘ	DEAD AL 8 W	LATIN SMALL LETTER W WITH RING ABOVE
1E99	ẙ	DEAD AL 8 Y	LATIN SMALL LETTER Y WITH RING ABOVE
1E9A	ẚ	DEAD AL 0 Q	LATIN SMALL LETTER A WITH RIGHT HALF RING
1E9B	ẛ	*HELD AL . S*	LATIN SMALL LETTER LONG S WITH DOT ABOVE
1E9C	ẜ	*HELD AL / S*	LATIN SMALL LETTER LONG S WITH DIAGONAL STROKE
1E9D	ẝ	*HELD AL - S*	LATIN SMALL LETTER LONG S WITH HIGH STROKE
1E9E	ẞ	LIVE BC S	LATIN CAPITAL LETTER SHARP S
1E9F	ẟ	*HELD AL 4 D*	LATIN SMALL LETTER DELTA
1EA0	Ạ	DEAD AU \ A	LATIN CAPITAL LETTER A WITH DOT BELOW
1EA1	ạ	DEAD AL \ A	LATIN SMALL LETTER A WITH DOT BELOW
1EA2	Ả	DEAD AU 7 A	LATIN CAPITAL LETTER A WITH HOOK ABOVE
1EA3	ả	DEAD AL 7 A	LATIN SMALL LETTER A WITH HOOK ABOVE
1EA4	Ấ	*HELD AU ' G*	LATIN CAPITAL LETTER A WITH CIRCUMFLEX AND ACUTE
1EA5	ấ	*HELD AL ' G*	LATIN SMALL LETTER A WITH CIRCUMFLEX AND ACUTE
1EA6	Ầ	*HELD AU ` G*	LATIN CAPITAL LETTER A WITH CIRCUMFLEX AND GRAVE
1EA7	ầ	*HELD AL ` G*	LATIN SMALL LETTER A WITH CIRCUMFLEX AND GRAVE
1EA8	Ẩ	*HELD AU 7 G*	LATIN CAPITAL LETTER A WITH CIRCUMFLEX AND HOOK ABOVE
1EA9	ẩ	*HELD AL 7 G*	LATIN SMALL LETTER A WITH CIRCUMFLEX AND HOOK ABOVE
1EAA	Ẫ	*HELD AU 1 G*	LATIN CAPITAL LETTER A WITH CIRCUMFLEX AND TILDE
1EAB	ẫ	*HELD AL 1 G*	LATIN SMALL LETTER A WITH CIRCUMFLEX AND TILDE
1EAC	Ậ	*HELD AU \ G*	LATIN CAPITAL LETTER A WITH CIRCUMFLEX AND DOT BELOW
1EAD	ậ	*HELD AL \ G*	LATIN SMALL LETTER A WITH CIRCUMFLEX AND DOT BELOW

1EAE	Ắ	*HELD AU ' Q*	LATIN CAPITAL LETTER A WITH BREVE AND ACUTE
1EAF	ắ	*HELD AL ' Q*	LATIN SMALL LETTER A WITH BREVE AND ACUTE
1EB0	Ằ	*HELD AU ` Q*	LATIN CAPITAL LETTER A WITH BREVE AND GRAVE
1EB1	ằ	*HELD AL ` Q*	LATIN SMALL LETTER A WITH BREVE AND GRAVE
1EB2	Ẳ	*HELD AU 7 Q*	LATIN CAPITAL LETTER A WITH BREVE AND HOOK ABOVE
1EB3	ẳ	*HELD AL 7 Q*	LATIN SMALL LETTER A WITH BREVE AND HOOK ABOVE
1EB4	Ẵ	*HELD AU 1 Q*	LATIN CAPITAL LETTER A WITH BREVE AND TILDE
1EB5	ẵ	*HELD AL 1 Q*	LATIN SMALL LETTER A WITH BREVE AND TILDE
1EB6	Ặ	*HELD AU \ Q*	LATIN CAPITAL LETTER A WITH BREVE AND DOT BELOW
1EB7	ặ	*HELD AL \ Q*	LATIN SMALL LETTER A WITH BREVE AND DOT BELOW
1EB8	Ẹ	DEAD AU \ E	LATIN CAPITAL LETTER E WITH DOT BELOW
1EB9	ẹ	DEAD AL \ E	LATIN SMALL LETTER E WITH DOT BELOW
1EBA	Ẻ	DEAD AU 7 E	LATIN CAPITAL LETTER E WITH HOOK ABOVE
1EBB	ẻ	DEAD AL 7 E	LATIN SMALL LETTER E WITH HOOK ABOVE
1EBC	Ẽ	DEAD AU 1 E	LATIN CAPITAL LETTER E WITH TILDE
1EBC	Ẽ	LIVE BC E	LATIN CAPITAL LETTER E WITH TILDE
1EBD	ẽ	DEAD AL 1 E	LATIN SMALL LETTER E WITH TILDE
1EBD	ẽ	LIVE AB E	LATIN SMALL LETTER E WITH TILDE
1EBE	Ế	*HELD AU ' F*	LATIN CAPITAL LETTER E WITH CIRCUMFLEX AND ACUTE
1EBF	ế	*HELD AL ' F*	LATIN SMALL LETTER E WITH CIRCUMFLEX AND ACUTE
1EC0	Ề	*HELD AU ` F*	LATIN CAPITAL LETTER E WITH CIRCUMFLEX AND GRAVE
1EC1	ề	*HELD AL ` F*	LATIN SMALL LETTER E WITH CIRCUMFLEX AND GRAVE
1EC2	Ể	*HELD AU 7 F*	LATIN CAPITAL LETTER E WITH CIRCUMFLEX AND HOOK ABOVE
1EC3	ể	*HELD AL 7 F*	LATIN SMALL LETTER E WITH CIRCUMFLEX AND HOOK ABOVE
1EC4	Ễ	*HELD AU 1 F*	LATIN CAPITAL LETTER E WITH CIRCUMFLEX AND TILDE
1EC5	ễ	*HELD AL 1 F*	LATIN SMALL LETTER E WITH CIRCUMFLEX AND TILDE
1EC6	Ệ	*HELD AU \ F*	LATIN CAPITAL LETTER E WITH CIRCUMFLEX AND DOT BELOW
1EC7	ệ	*HELD AL \ F*	LATIN SMALL LETTER E WITH CIRCUMFLEX AND DOT BELOW
1EC8	Ỉ	DEAD AU 7 I	LATIN CAPITAL LETTER I WITH HOOK ABOVE
1EC9	ỉ	DEAD AL 7 I	LATIN SMALL LETTER I WITH HOOK ABOVE
1ECA	Ị	DEAD AU \ I	LATIN CAPITAL LETTER I WITH DOT BELOW
1ECB	ị	DEAD AL \ I	LATIN SMALL LETTER I WITH DOT BELOW
1ECC	Ọ	DEAD AU \ O	LATIN CAPITAL LETTER O WITH DOT BELOW
1ECD	ọ	DEAD AL \ O	LATIN SMALL LETTER O WITH DOT BELOW

1ECE	Ỏ	DEAD AU 7 O	LATIN CAPITAL LETTER O WITH HOOK ABOVE
1ECF	ỏ	DEAD AL 7 O	LATIN SMALL LETTER O WITH HOOK ABOVE
1ED0	Ố	*HELD AU ' K*	LATIN CAPITAL LETTER O WITH CIRCUMFLEX AND ACUTE
1ED1	ố	*HELD AL ' K*	LATIN SMALL LETTER O WITH CIRCUMFLEX AND ACUTE
1ED2	Ồ	*HELD AU ` K*	LATIN CAPITAL LETTER O WITH CIRCUMFLEX AND GRAVE
1ED3	ồ	*HELD AL ` K*	LATIN SMALL LETTER O WITH CIRCUMFLEX AND GRAVE
1ED4	Ổ	*HELD AU 7 K*	LATIN CAPITAL LETTER O WITH CIRCUMFLEX AND HOOK ABOVE
1ED5	ổ	*HELD AL 7 K*	LATIN SMALL LETTER O WITH CIRCUMFLEX AND HOOK ABOVE
1ED6	Ỗ	*HELD AU 1 K*	LATIN CAPITAL LETTER O WITH CIRCUMFLEX AND TILDE
1ED7	ỗ	*HELD AL 1 K*	LATIN SMALL LETTER O WITH CIRCUMFLEX AND TILDE
1ED8	Ộ	*HELD AU \ K*	LATIN CAPITAL LETTER O WITH CIRCUMFLEX AND DOT BELOW
1ED9	ộ	*HELD AL \ K*	LATIN SMALL LETTER O WITH CIRCUMFLEX AND DOT BELOW
1EDA	Ớ	*HELD AU ' B*	LATIN CAPITAL LETTER O WITH HORN AND ACUTE
1EDB	ớ	*HELD AL ' B*	LATIN SMALL LETTER O WITH HORN AND ACUTE
1EDC	Ờ	*HELD AU ` B*	LATIN CAPITAL LETTER O WITH HORN AND GRAVE
1EDD	ờ	*HELD AL ` B*	LATIN SMALL LETTER O WITH HORN AND GRAVE
1EDE	Ở	*HELD AU 7 B*	LATIN CAPITAL LETTER O WITH HORN AND HOOK ABOVE
1EDF	ở	*HELD AL 7 B*	LATIN SMALL LETTER O WITH HORN AND HOOK ABOVE
1EE0	Ỡ	*HELD AU 1 B*	LATIN CAPITAL LETTER O WITH HORN AND TILDE
1EE1	ỡ	*HELD AL 1 B*	LATIN SMALL LETTER O WITH HORN AND TILDE
1EE2	Ợ	*HELD AU \ B*	LATIN CAPITAL LETTER O WITH HORN AND DOT BELOW
1EE3	ợ	*HELD AL \ B*	LATIN SMALL LETTER O WITH HORN AND DOT BELOW
1EE4	Ụ	DEAD AU . U	LATIN CAPITAL LETTER U WITH DOT BELOW
1EE4	Ụ	DEAD AU \ U	LATIN CAPITAL LETTER U WITH DOT BELOW
1EE5	ụ	DEAD AL . U	LATIN SMALL LETTER U WITH DOT BELOW
1EE5	ụ	DEAD AL \ U	LATIN SMALL LETTER U WITH DOT BELOW
1EE6	Ủ	DEAD AU 7 U	LATIN CAPITAL LETTER U WITH HOOK ABOVE
1EE7	ủ	DEAD AL 7 U	LATIN SMALL LETTER U WITH HOOK ABOVE
1EE8	Ứ	*HELD AU ' V*	LATIN CAPITAL LETTER U WITH HORN AND ACUTE
1EE9	ứ	*HELD AL ' V*	LATIN SMALL LETTER U WITH HORN AND ACUTE
1EEA	Ừ	*HELD AU ` V*	LATIN CAPITAL LETTER U WITH HORN AND GRAVE
1EEB	ừ	*HELD AL ` V*	LATIN SMALL LETTER U WITH HORN AND GRAVE
1EEC	Ử	*HELD AU 7 V*	LATIN CAPITAL LETTER U WITH HORN AND HOOK ABOVE
1EED	ử	*HELD AL 7 V*	LATIN SMALL LETTER U WITH HORN AND HOOK ABOVE

1EEE	Ữ	*HELD AU 1 V*	LATIN CAPITAL LETTER U WITH HORN AND TILDE
1EEF	ữ	*HELD AL 1 V*	LATIN SMALL LETTER U WITH HORN AND TILDE
1EF0	Ự	*HELD AU \ V*	LATIN CAPITAL LETTER U WITH HORN AND DOT BELOW
1EF1	ự	*HELD AL \ V*	LATIN SMALL LETTER U WITH HORN AND DOT BELOW
1EF2	Ỳ	DEAD AU ` Y	LATIN CAPITAL LETTER Y WITH GRAVE
1EF2	Ỳ	LIVE BU Y	LATIN CAPITAL LETTER Y WITH GRAVE
1EF3	ỳ	DEAD AL ` Y	LATIN SMALL LETTER Y WITH GRAVE
1EF3	ỳ	LIVE BL Y	LATIN SMALL LETTER Y WITH GRAVE
1EF4	Ỵ	DEAD AU \ Y	LATIN CAPITAL LETTER Y WITH DOT BELOW
1EF5	ỵ	DEAD AL \ Y	LATIN SMALL LETTER Y WITH DOT BELOW
1EF6	Ỷ	DEAD AU 7 Y	LATIN CAPITAL LETTER Y WITH HOOK ABOVE
1EF7	ỷ	DEAD AL 7 Y	LATIN SMALL LETTER Y WITH HOOK ABOVE
1EF8	Ỹ	DEAD AU 1 Y	LATIN CAPITAL LETTER Y WITH TILDE
1EF8	Ỹ	LIVE BC Y	LATIN CAPITAL LETTER Y WITH TILDE
1EF9	ỹ	DEAD AL 1 Y	LATIN SMALL LETTER Y WITH TILDE
1EF9	ỹ	LIVE AB Y	LATIN SMALL LETTER Y WITH TILDE
1EFA	Ỻ	DEAD AU 8 L	LATIN CAPITAL LETTER MIDDLE-WELSH LL
1EFB	ỻ	DEAD AL 8 L	LATIN SMALL LETTER MIDDLE-WELSH LL
1EFC	Ỽ	DEAD AU 8 6	LATIN CAPITAL LETTER MIDDLE-WELSH V
1EFD	ỽ	DEAD AL 8 6	LATIN SMALL LETTER MIDDLE-WELSH V
1EFE	Ỿ	DEAD AU M Y	LATIN CAPITAL LETTER Y WITH LOOP
1EFF	ỿ	DEAD AL M Y	LATIN SMALL LETTER Y WITH LOOP

Range U+2000 to U+2FFF

U+	Sym	Key Sequence	Description
2000		HELD AL . N	EN QUAD
2001		HELD AL . M	EM QUAD
2002		HELD AL / N	EN SPACE
2003		HELD AL / M	EM SPACE
2004		HELD AL / 3	THREE-PER-EM SPACE
2005		HELD AL / 4	FOUR-PER-EM SPACE
2006		HELD AL / 6	SIX-PER-EM SPACE
2007		HELD AL / F	FIGURE SPACE
2008		HELD AL / P	PUNCTUATION SPACE
2009		HELD AL / T	THIN SPACE
200A		HELD AL / H	HAIR SPACE
200B		HELD AL / Z	ZERO WIDTH SPACE
200C		HELD AL / .	ZERO WIDTH NON-JOINER
200C		LIVE AC \	ZERO WIDTH NON-JOINER
200D		HELD AL / ,	ZERO WIDTH JOINER
200E		AL X CL M	LEFT-TO-RIGHT MARK
200F		AL X BL M	RIGHT-TO-LEFT MARK
2010	-	DEAD AL - =	HYPHEN
2010	-	HELD AL - =	HYPHEN
2011	-	DEAD AL - 0	NON-BREAKING HYPHEN
2011	-	HELD AL - 0	NON-BREAKING HYPHEN
2011	-	LIVE BU -	NON-BREAKING HYPHEN
2012	–	HELD AL - F	FIGURE DASH
2013	–	HELD AL - N	EN DASH
2013	–	LIVE AC -	EN DASH
2014	—	HELD AL - M	EM DASH
2014	—	LIVE AC =	EM DASH
2015	—	HELD AL - H	HORIZONTAL BAR
2016	‖	DEAD AL 3 \	DOUBLE VERTICAL LINE
2017	‗	DEAD AL M =	DOUBLE LOW LINE

2017	‗	*HELD AL 3 =*	DOUBLE LOW LINE
2017	‗	HYP ABC =	DOUBLE LOW LINE
2018	‘	LIVE CL [	LEFT SINGLE QUOTATION MARK
2019	’	LIVE BL ,	RIGHT SINGLE QUOTATION MARK
2019	’	LIVE CL]	RIGHT SINGLE QUOTATION MARK
201A	‚	LIVE CL ;	SINGLE LOW-9 QUOTATION MARK
201B	‛	LIVE CL '	SINGLE HIGH-REVERSED-9 QUOTATION MARK
201C	“	LIVE CU [	LEFT DOUBLE QUOTATION MARK
201D	”	LIVE CU]	RIGHT DOUBLE QUOTATION MARK
201E	„	LIVE CU ;	DOUBLE LOW-9 QUOTATION MARK
201F	‟	LIVE CU '	DOUBLE HIGH-REVERSED-9 QUOTATION MARK
2020	†	LIVE AC 1	DAGGER
2021	‡	LIVE AC 2	DOUBLE DAGGER
2022	•	LIVE BC -	BULLET
2023	‣	DEAD AL -]	TRIANGULAR BULLET
2024	․	*HELD AL . 1*	ONE DOT LEADER
2025	‥	AL ; BL ;	TWO DOT LEADER
2025	‥	*HELD AL . 2*	TWO DOT LEADER
2026	…	DEAD AL , .	HORIZONTAL ELLIPSIS
2026	…	LIVE BL .	HORIZONTAL ELLIPSIS
2027	▪	LIVE CU 9	HYPHENATION POINT
2028		*HELD AU / L*	LINE SEPARATOR
2029		*HELD AU / P*	PARAGRAPH SEPARATOR
202A		AL X CL E	LEFT-TO-RIGHT EMBEDDING
202B		AL X BL E	RIGHT-TO-LEFT EMBEDDING
202C		AL X CL F	POP DIRECTIONAL FORMATTING
202D		AL X CL O	LEFT-TO-RIGHT OVERRIDE
202E		AL X BL O	RIGHT-TO-LEFT OVERRIDE
202F		DEAD AL / '	NARROW NO-BREAK SPACE
202F		DEAD AL M SP	NARROW NO-BREAK SPACE
202F		DEAD AU M SP	NARROW NO-BREAK SPACE
202F		*HELD AL / '*	NARROW NO-BREAK SPACE
202F		LIVE CU `	NARROW NO-BREAK SPACE
2030	‰	LIVE CL 5	PER MILLE SIGN
2031	‱	DEAD AL 3 5	PER TEN THOUSAND SIGN

2032	′	DEAD AL 1 '	PRIME
2032	′	HYP ABC [	PRIME
2032	′	LIVE AC G	PRIME
2033	″	DEAD AL 2 '	DOUBLE PRIME
2033	″	HYP ABC]	DOUBLE PRIME
2033	″	LIVE AC H	DOUBLE PRIME
2034	‴	DEAD AL 3 '	TRIPLE PRIME
2034	‴	HYP ABC \	TRIPLE PRIME
2035		HYP BCU [	REVERSED PRIME
2036		HYP BCU]	REVERSED DOUBLE PRIME
2037		HYP BCU \	REVERSED TRIPLE PRIME
2038	‸	DEAD AL 6 /	CARET
2039	‹	LIVE AB [	SINGLE LEFT-POINTING ANGLE QUOTATION MARK
203A	›	LIVE AB]	SINGLE RIGHT-POINTING ANGLE QUOTATION MARK
203B	※	DEAD AL 1 /	REFERENCE MARK
203C	‼	DEAD AL M 1	DOUBLE EXCLAMATION MARK
203C	‼	LIVE AB 1	DOUBLE EXCLAMATION MARK
203D	‽	LIVE AC /	INTERROBANG
203E	‾	DEAD AL 3 =	OVERLINE
203F	‿	DEAD AL M 0	UNDERTIE
2040	⁀	*HELD AL M 9*	CHARACTER TIE
2041	⁁	DEAD AL / 6	CARET INSERTION POINT
2042	⁂	DEAD AL 3 8	ASTERISM
2043	⁃	DEAD AL - [	HYPHEN BULLET
2044	⁄	DEAD AL [/	FRACTION SLASH
2044	⁄	DEAD AL] /	FRACTION SLASH
2044	⁄	*HELD AL [/*	FRACTION SLASH
2044	⁄	*HELD AL] /*	FRACTION SLASH
2045	⁅	DEAD AL ` [	LEFT SQUARE BRACKET WITH QUILL
2046	⁆	DEAD AL `]	RIGHT SQUARE BRACKET WITH QUILL
2047	⁇	DEAD AL M /	DOUBLE QUESTION MARK
2048	⁈	*HELD AL M /*	QUESTION EXCLAMATION MARK
2049	⁉	*HELD AL M 1*	EXCLAMATION QUESTION MARK
204A	⁊	DEAD AL 7 7	TIRONIAN SIGN ET
204B	⁋	DEAD AL 3 9	REVERSED PILCROW SIGN
204E	∗	DEAD AL 1 8	LOW ASTERISK

2050	⌒	*HELD AL M 0*	CLOSE UP
2051	⁑	DEAD AL 2 8	TWO ASTERISKS ALIGNED VERTICALLY
2052	⁒	DEAD AL 4 5	COMMERCIAL MINUS SIGN
2053	⁓	*HELD AL 1 `*	SWUNG DASH
2054	‿	DEAD AL M 9	INVERTED UNDERTIE
2056	∴	DEAD AL = 3	THREE DOT PUNCTUATION
2057	⁗	DEAD AL 4 '	QUADRUPLE PRIME
2058	∷	DEAD AL = 4	FOUR DOT PUNCTUATION
2059	⁙	DEAD AL = 5	FIVE DOT PUNCTUATION
205A	⁚	*HELD AL 2 ;*	TWO DOT PUNCTUATION
205B	⁛	*HELD AL 4 ;*	FOUR DOT MARK
205D	⁝	DEAD AL 3 ;	TRICOLON
205D	⁝	DEAD AL ; 3	TRICOLON
205E	⁞	DEAD AL 4 ;	VERTICAL FOUR DOTS
205E	⁞	DEAD AL ; 4	VERTICAL FOUR DOTS
205E	⁞	LIVE CU \	VERTICAL FOUR DOTS
205F		*HELD AL / 5*	MEDIUM MATHEMATICAL SPACE
2060		*HELD AL / W*	WORD JOINER
2066		AL X CL I	LEFT-TO-RIGHT ISOLATE
2067		AL X BL I	RIGHT-TO-LEFT ISOLATE
2068		AL X CL S	FIRST STRONG ISOLATE
2069		AL X CL L	POP DIRECTIONAL ISOLATE
2070	⁰	DEAD AL [0	SUPERSCRIPT ZERO
2070	⁰	*HELD AL [0*	SUPERSCRIPT ZERO
2071	ⁱ	*HELD AL M I*	SUPERSCRIPT LATIN SMALL LETTER I
2071	ⁱ	*HELD AU 9 I*	SUPERSCRIPT LATIN SMALL LETTER I
2074	⁴	DEAD AL [4	SUPERSCRIPT FOUR
2074	⁴	*HELD AL [4*	SUPERSCRIPT FOUR
2075	⁵	DEAD AL [5	SUPERSCRIPT FIVE
2075	⁵	*HELD AL [5*	SUPERSCRIPT FIVE
2076	⁶	DEAD AL [6	SUPERSCRIPT SIX
2076	⁶	*HELD AL [6*	SUPERSCRIPT SIX
2077	⁷	DEAD AL [7	SUPERSCRIPT SEVEN
2077	⁷	*HELD AL [7*	SUPERSCRIPT SEVEN
2078	⁸	DEAD AL [8	SUPERSCRIPT EIGHT

2078	⁸	*HELD AL [8*	SUPERSCRIPT EIGHT
2079	⁹	DEAD AL [9	SUPERSCRIPT NINE
2079	⁹	*HELD AL [9*	SUPERSCRIPT NINE
207A	⁺	DEAD AU [=	SUPERSCRIPT PLUS SIGN
207A	⁺	*HELD AU [=*	SUPERSCRIPT PLUS SIGN
207B	⁻	DEAD AL [-	SUPERSCRIPT MINUS
207B	⁻	*HELD AL [-*	SUPERSCRIPT MINUS
207C	⁼	DEAD AL [=	SUPERSCRIPT EQUALS SIGN
207C	⁼	*HELD AL [=*	SUPERSCRIPT EQUALS SIGN
207D	⁽	DEAD AU [9	SUPERSCRIPT LEFT PARENTHESIS
207D	⁽	*HELD AU [9*	SUPERSCRIPT LEFT PARENTHESIS
207E	⁾	DEAD AU [0	SUPERSCRIPT RIGHT PARENTHESIS
207E	⁾	*HELD AU [0*	SUPERSCRIPT RIGHT PARENTHESIS
207F	ⁿ	*HELD AL M N*	SUPERSCRIPT LATIN SMALL LETTER N
2080	₀	DEAD AL] 0	SUBSCRIPT ZERO
2080	₀	*HELD AL] 0*	SUBSCRIPT ZERO
2081	₁	DEAD AL] 1	SUBSCRIPT ONE
2081	₁	*HELD AL] 1*	SUBSCRIPT ONE
2082	₂	DEAD AL] 2	SUBSCRIPT TWO
2082	₂	*HELD AL] 2*	SUBSCRIPT TWO
2083	₃	DEAD AL] 3	SUBSCRIPT THREE
2083	₃	*HELD AL] 3*	SUBSCRIPT THREE
2084	₄	DEAD AL] 4	SUBSCRIPT FOUR
2084	₄	*HELD AL] 4*	SUBSCRIPT FOUR
2085	₅	DEAD AL] 5	SUBSCRIPT FIVE
2085	₅	*HELD AL] 5*	SUBSCRIPT FIVE
2086	₆	DEAD AL] 6	SUBSCRIPT SIX
2086	₆	*HELD AL] 6*	SUBSCRIPT SIX
2087	₇	DEAD AL] 7	SUBSCRIPT SEVEN
2087	₇	*HELD AL] 7*	SUBSCRIPT SEVEN
2088	₈	DEAD AL] 8	SUBSCRIPT EIGHT
2088	₈	*HELD AL] 8*	SUBSCRIPT EIGHT
2089	₉	DEAD AL] 9	SUBSCRIPT NINE
2089	₉	*HELD AL] 9*	SUBSCRIPT NINE

208A	₊	DEAD AU] =	SUBSCRIPT PLUS SIGN
208A	₊	*HELD AU] =*	SUBSCRIPT PLUS SIGN
208B	₋	DEAD AL] -	SUBSCRIPT MINUS
208B	₋	*HELD AL] -*	SUBSCRIPT MINUS
208C	₌	DEAD AL] =	SUBSCRIPT EQUALS SIGN
208C	₌	*HELD AL] =*	SUBSCRIPT EQUALS SIGN
208D	₍	DEAD AU] 9	SUBSCRIPT LEFT PARENTHESIS
208D	₍	*HELD AU] 9*	SUBSCRIPT LEFT PARENTHESIS
208E	₎	DEAD AU] 0	SUBSCRIPT RIGHT PARENTHESIS
208E	₎	*HELD AU] 0*	SUBSCRIPT RIGHT PARENTHESIS
2090	ₐ	*HELD AL 9 A*	LATIN SUBSCRIPT SMALL LETTER A
2091	ₑ	*HELD AL 9 E*	LATIN SUBSCRIPT SMALL LETTER E
2092	ₒ	*HELD AL 9 O*	LATIN SUBSCRIPT SMALL LETTER O
2093	ₓ	*HELD AL 9 X*	LATIN SUBSCRIPT SMALL LETTER X
2094	ₔ	*HELD AL 9 `*	LATIN SUBSCRIPT SMALL LETTER SCHWA
2095	ₕ	*HELD AL 9 H*	LATIN SUBSCRIPT SMALL LETTER H
2096	ₖ	*HELD AL 9 K*	LATIN SUBSCRIPT SMALL LETTER K
2097	ₗ	*HELD AL 9 L*	LATIN SUBSCRIPT SMALL LETTER L
2098	ₘ	*HELD AL 9 M*	LATIN SUBSCRIPT SMALL LETTER M
2099	ₙ	*HELD AL 9 N*	LATIN SUBSCRIPT SMALL LETTER N
209A	ₚ	*HELD AL 9 P*	LATIN SUBSCRIPT SMALL LETTER P
209B	ₛ	*HELD AL 9 S*	LATIN SUBSCRIPT SMALL LETTER S
209C	ₜ	*HELD AL 9 T*	LATIN SUBSCRIPT SMALL LETTER T
20A0	₠	*HELD AL] E*	EURO-CURRENCY SIGN
20A1	₡	*HELD AL [C*	COLON SIGN (COLÓN SIGN)
20A2	₢	*HELD AL [X*	CRUZEIRO SIGN
20A3	₣	*HELD AL] F*	FRENCH FRANC SIGN
20A4	₤	*HELD AL [L*	LIRA SIGN
20A5	₥	*HELD AL] M*	MILL SIGN
20A6	₦	*HELD AL [N*	NAIRA SIGN
20A7	₧	*HELD AL \ P*	PESETA SIGN
20A8	₨	*HELD AL [R*	RUPEE SIGN
20A9	₩	*HELD AL [W*	WON SIGN
20A9	₩	LIVE AC W	WON SIGN
20AA	₪	*HELD AL [S*	NEW SHEQEL SIGN

20AB	₫	HELD AL [D	DONG SIGN
20AB	₫	LIVE AC U	DONG SIGN
20AC	€	HELD AL [E	EURO SIGN
20AC	€	LIVE CL 4	EURO SIGN
20AD	₭	HELD AL [K	KIP SIGN
20AE	₮	HELD AL \ T	TUGRIK SIGN
20AF	₯	HELD AL] D	DRACHMA SIGN
20B0	₰	HELD AL] G	GERMAN PENNY SIGN
20B1	₱	HELD AL] P	PESO SIGN
20B2	₲	HELD AL [G	GUARANI SIGN
20B3	₳	HELD AL] A	AUSTRAL SIGN
20B4	₴	HELD AL [H	HRYVNIA SIGN
20B5	₵	HELD AL] C	CEDI SIGN
20B6	₶	HELD AL] H	LIVRE TOURNOIS SIGN
20B7	₷	HELD AL] X	SPESMILO SIGN
20B8	₸	HELD AL] T	TENGE SIGN
20B9	₹	HELD AL [I	INDIAN RUPEE SIGN
20B9	₹	LIVE AC I	INDIAN RUPEE SIGN
20BA	₺	HELD AL [T	TURKISH LIRA SIGN
20BB	₻	HELD AL] N	NORDIC MARK SIGN
20BC	₼	HELD AL [M	MANAT SIGN
20BD	₽	HELD AL [P	RUBLE SIGN
20BD	₽	LIVE AC P	RUBLE SIGN
20BE	₾	HELD AL] L	LARI SIGN
20BF	฿	HELD AL [B	BITCOIN CURRENCY SIGN (NEW)
20D0	◌⃐	DEAD AL 8 ,	COMBINING LEFT HARPOON ABOVE
20D1	◌⃑	DEAD AL 8 .	COMBINING RIGHT HARPOON ABOVE
20D2	◌⃒	DEAD AU \ \	COMBINING LONG VERTICAL LINE OVERLAY
20D6	◌⃖	HELD AL 8 ,	COMBINING LEFT ARROW ABOVE
20D7	◌⃗	HELD AL 8 .	COMBINING RIGHT ARROW ABOVE
20DB	◌⃛	HELD AL ; 3	COMBINING THREE DOTS ABOVE
20DC	◌⃜	HELD AL ; 4	COMBINING FOUR DOTS ABOVE
20E1	◌⃡	HELD AL 8 /	COMBINING LEFT RIGHT ARROW ABOVE
20E5	◌⃥	DEAD AL \ \	COMBINING REVERSE SOLIDUS OVERLAY
20E6	◌⃦	HELD AU \ \	COMBINING DOUBLE VERTICAL STROKE OVERLAY

20E9	⃩	HELD AL [ ]	COMBINING WIDE BRIDGE ABOVE
20F0	⃰	HELD AL 6 8	COMBINING ASTERISK ABOVE
2100	℀	HELD AL ` A	ACCOUNT OF
2101	℁	HELD AL ` S	ADDRESSED TO THE SUBJECT
2102	ℂ	HELD AL ; C	DOUBLE-STRUCK CAPITAL C
2103	℃	HELD AL 5 C	DEGREE CELSIUS
2104	℄	HELD AL ` L	CENTRE LINE SYMBOL
2105	℅	LIVE CU 5	CARE OF
2106	℆	HELD AL ` C	CADA UNA
2108	℈	DEAD AL M 2	SCRUPLE/APOTHECARY
2109	℉	HELD AL 5 F	DEGREE FAHRENHEIT
210B	ℋ	HELD AU [H	SCRIPT CAPITAL H
210C	ℌ	HELD AU] H	BLACK-LETTER CAPITAL H
210D	ℍ	HELD AL ; H	DOUBLE-STRUCK CAPITAL H
2110	ℐ	HELD AU [I	SCRIPT CAPITAL I
2111	ℑ	HELD AU] I	BLACK-LETTER CAPITAL I
2112	ℒ	HELD AU [L	SCRIPT CAPITAL L
2113	ℓ	DEAD AL ` L	SCRIPT SMALL L
2114	℔	DEAD AL M 6	L B BAR SYMBOL, POUND/APOTHECARY
2115	ℕ	HELD AL ; N	DOUBLE-STRUCK CAPITAL N
2116	№	LIVE AC 3	NUMERO SIGN
2117	℗	DEAD AL 3 P	SOUND RECORDING COPYRIGHT
2118	℘	HELD AU [P	SCRIPT CAPITAL P
2119	ℙ	HELD AL ; P	DOUBLE-STRUCK CAPITAL P
211A	ℚ	HELD AL ; Q	DOUBLE-STRUCK CAPITAL Q
211B	ℛ	HELD AU [R	SCRIPT CAPITAL R
211C	ℜ	HELD AU] R	BLACK-LETTER CAPITAL R
211D	ℝ	HELD AL ; R	DOUBLE-STRUCK CAPITAL R
211E	℞	DEAD AL M R	PRESCRIPTION TAKE
211E	℞	DEAD AU M R	PRESCRIPTION TAKE
211F	℟	HELD AL / R	RESPONSE
2120	℠	LIVE AC Z	SERVICE MARK
2121	℡	DEAD AL 1 T	TELEPHONE SIGN
2122	™	LIVE AC T	TRADE MARK SIGN
2123	℣	HELD AL / V	VERSICLE
2124	ℤ	HELD AL ; Z	DOUBLE-STRUCK CAPITAL Z

2125	℥	DEAD AL M 3	OUNCE SIGN/APOTHECARY
2126	Ω	DEAD AL M O	OHM SIGN
2126	Ω	LIVE CU M	OHM SIGN
2128	ℨ	*HELD AU] Z*	BLACK-LETTER CAPITAL Z
212C	ℬ	*HELD AU [B*	SCRIPT CAPITAL B
212D	ℭ	*HELD AU] C*	BLACK-LETTER CAPITAL C
212E	℮	DEAD AL ` 9	ESTIMATED SYMBOL
212F	ℯ	*HELD AL / E*	SCRIPT SMALL E
2130	ℰ	*HELD AU [E*	SCRIPT CAPITAL E
2131	ℱ	*HELD AU [F*	SCRIPT CAPITAL F
2132	Ⅎ	DEAD AU 3 F	TURNED CAPITAL F
2133	ℳ	*HELD AU [M*	SCRIPT CAPITAL M
2135	ℵ	*HELD AU = A*	ALEF SYMBOL
2136	ℶ	*HELD AU = B*	BET SYMBOL
2137	ℷ	*HELD AU = G*	GIMEL SYMBOL
2138	ℸ	*HELD AU = D*	DALET SYMBOL
213B	FAX	DEAD AL 1 F	FACSIMILE SIGN
214A	⅊	*HELD AL ` P*	PROPERTY LINE
214B	⅋	DEAD AL 2 7	TURNED AMPERSAND
214D	⅍	LIVE AC Q	AKTIESELSKAB
214E	ⅎ	DEAD AL 3 F	TURNED SMALL F
2150	⅐	*HELD AL 1 7*	VULGAR FRACTION ONE SEVENTH
2151	⅑	*HELD AL 1 9*	VULGAR FRACTION ONE NINTH
2152	⅒	*HELD AL 1 0*	VULGAR FRACTION ONE TENTH
2153	⅓	*HELD AL 1 3*	VULGAR FRACTION ONE THIRD
2153	⅓	LIVE AB 3	VULGAR FRACTION ONE THIRD
2154	⅔	*HELD AL 2 3*	VULGAR FRACTION TWO THIRDS
2154	⅔	LIVE BC 3	VULGAR FRACTION TWO THIRDS
2155	⅕	*HELD AL 1 5*	VULGAR FRACTION ONE FIFTH
2155	⅕	LIVE AB 5	VULGAR FRACTION ONE FIFTH
2156	⅖	*HELD AL 2 5*	VULGAR FRACTION TWO FIFTHS
2156	⅖	LIVE AB 7	VULGAR FRACTION TWO FIFTHS
2157	⅗	*HELD AL 3 5*	VULGAR FRACTION THREE FIFTHS
2157	⅗	LIVE BC 7	VULGAR FRACTION THREE FIFTHS
2158	⅘	*HELD AL 4 5*	VULGAR FRACTION FOUR FIFTHS

2158	⅘	LIVE BC 5	VULGAR FRACTION FOUR FIFTHS
2159	⅙	*HELD AL 1 6*	VULGAR FRACTION ONE SIXTH
2159	⅙	LIVE AB 6	VULGAR FRACTION ONE SIXTH
215A	⅚	*HELD AL 5 6*	VULGAR FRACTION FIVE SIXTHS
215A	⅚	LIVE BC 6	VULGAR FRACTION FIVE SIXTHS
215B	⅛	*HELD AL 1 8*	VULGAR FRACTION ONE EIGHTH
215B	⅛	LIVE AB 8	VULGAR FRACTION ONE EIGHTH
215C	⅜	*HELD AL 3 8*	VULGAR FRACTION THREE EIGHTHS
215C	⅜	LIVE AB 9	VULGAR FRACTION THREE EIGHTHS
215D	⅝	*HELD AL 5 8*	VULGAR FRACTION FIVE EIGHTHS
215D	⅝	LIVE BC 9	VULGAR FRACTION FIVE EIGHTHS
215E	⅞	*HELD AL 7 8*	VULGAR FRACTION SEVEN EIGHTHS
215E	⅞	LIVE BC 8	VULGAR FRACTION SEVEN EIGHTHS
215F	⅟	*HELD AL 1 /*	FRACTION NUMERATOR ONE
2189	↉	*HELD AL 0 3*	VULGAR FRACTION ZERO THIRDS
218A	↊	DEAD AL 1 2	TURNED DIGIT TWO
218B	↋	DEAD AL 1 3	TURNED DIGIT THREE
2190	←	LIVE AB ,	LEFTWARDS ARROW
2191	↑	LIVE BC ,	UPWARDS ARROW
2192	→	LIVE AB .	RIGHTWARDS ARROW
2193	↓	LIVE BC .	DOWNWARDS ARROW
2194	↔	*HELD AL X -*	LEFT RIGHT ARROW
2195	↕	*HELD AL X *	UP DOWN ARROW
2196	↖	LIVE AB M	NORTH WEST ARROW
2197	↗	LIVE AB /	NORTH EAST ARROW
2198	↘	LIVE BC M	SOUTH EAST ARROW
2199	↙	LIVE BC /	SOUTH WEST ARROW
21A4	↤	DEAD AL - ,	LEFTWARDS ARROW FROM BAR
21A5	↥	*HELD AL - ,*	UPWARDS ARROW FROM BAR
21A6	↦	DEAD AL - .	RIGHTWARDS ARROW FROM BAR
21A7	↧	*HELD AL - .*	DOWNWARDS ARROW FROM BAR
21A8	↨	DEAD AL - /	UP DOWN ARROW WITH BASE
21AF	↯	DEAD AL 0 /	DOWNWARDS ZIGZAG ARROW
21B0	↰	DEAD AL - 3	UPWARDS ARROW WITH TIP LEFTWARDS
21B1	↱	DEAD AL - 4	UPWARDS ARROW WITH TIP RIGHTWARDS

21B2	↲	DEAD AL - 5	DOWNWARDS ARROW WITH TIP LEFTWARDS
21B3	↳	DEAD AL - 6	DOWNWARDS ARROW WITH TIP RIGHTWARDS
21B4	↴	DEAD AL - 7	RIGHTWARDS ARROW WITH CORNER DOWNWARDS
21B5	↵	DEAD AL - 8	DOWNWARDS ARROW WITH CORNER LEFTWARDS
21B6	↶	*HELD AU - ,*	ANTICLOCKWISE TOP SEMICIRCLE ARROW
21B7	↷	*HELD AU - .*	CLOCKWISE TOP SEMICIRCLE ARROW
21BC	↼	DEAD AU 1 ,	LEFTWARDS HARPOON WITH BARB UPWARDS
21BD	↽	DEAD AL 1 ,	LEFTWARDS HARPOON WITH BARB DOWNWARDS
21BE	↾	*HELD AU 1 ,*	UPWARDS HARPOON WITH BARB RIGHTWARDS
21BF	↿	*HELD AL 1 ,*	UPWARDS HARPOON WITH BARB LEFTWARDS
21C0	⇀	DEAD AL 1 .	RIGHTWARDS HARPOON WITH BARB UPWARDS
21C1	⇁	DEAD AU 1 .	RIGHTWARDS HARPOON WITH BARB DOWNWARDS
21C2	⇂	*HELD AL 1 .*	DOWNWARDS HARPOON WITH BARB RIGHTWARDS
21C3	⇃	*HELD AU 1 .*	DOWNWARDS HARPOON WITH BARB LEFTWARDS
21C4	⇄	DEAD AL] .	RIGHTWARDS ARROW OVER LEFTWARDS ARROW
21C5	⇅	*HELD AL] .*	UPWARDS ARROW LEFTWARDS OF DOWNWARDS ARROW
21C6	⇆	DEAD AL] ,	LEFTWARDS ARROW OVER RIGHTWARDS ARROW
21C7	⇇	DEAD AL [,	LEFTWARDS PAIRED ARROWS
21C8	⇈	*HELD AL [,*	UPWARDS PAIRED ARROWS
21C9	⇉	DEAD AL [.	RIGHTWARDS PAIRED ARROWS
21CA	⇊	*HELD AL [.*	DOWNWARDS PAIRED ARROWS
21D0	⇐	DEAD AL = ,	LEFTWARDS DOUBLE ARROW
21D1	⇑	*HELD AL = ,*	UPWARDS DOUBLE ARROW
21D2	⇒	DEAD AL = .	RIGHTWARDS DOUBLE ARROW
21D3	⇓	*HELD AL = .*	DOWNWARDS DOUBLE ARROW
21D4	⇔	*HELD AU = .*	LEFT RIGHT DOUBLE ARROW
21D5	⇕	*HELD AU = ,*	UP DOWN DOUBLE ARROW
21D6	⇖	DEAD AL = \	NORTH WEST DOUBLE ARROW
21D7	⇗	DEAD AL = /	NORTH EAST DOUBLE ARROW
21D8	⇘	*HELD AL = *	SOUTH EAST DOUBLE ARROW
21D9	⇙	*HELD AL = /*	SOUTH WEST DOUBLE ARROW
21DA	⇚	DEAD AL W ,	LEFTWARDS TRIPLE ARROW
21DB	⇛	DEAD AL W .	RIGHTWARDS TRIPLE ARROW
21F5	⇵	*HELD AL] ,*	DOWNWARDS ARROW LEFTWARDS OF UPWARDS ARROW
2200	∀	*HELD AL 5 A*	FOR ALL
2200	∀	HYP ABC 2	FOR ALL

2201	∁	*HELD AL 6 C*	COMPLEMENT
2202	∂	DEAD AL ` 1	PARTIAL DIFFERENTIAL
2202	∂	HYP BCU /	PARTIAL DIFFERENTIAL
2203	∃	*HELD AL 5 E*	THERE EXISTS
2203	∃	HYP ABC 3	THERE EXISTS
2204	∄	*HELD AU 5 E*	THERE DOES NOT EXIST
2205	∅	DEAD AL ` 0	EMPTY SET
2206	∆	*HELD AL 4 ,*	INCREMENT
2207	∇	*HELD AL 4 .*	NABLA
2208	∈	DEAD AL 2 9	ELEMENT OF
2209	∉	*HELD AL 2 9*	NOT AN ELEMENT OF
220A	∈	DEAD AU 2 9	SMALL ELEMENT OF
220B	∋	DEAD AL 2 0	CONTAINS AS MEMBER
220C	∌	*HELD AL 2 0*	DOES NOT CONTAIN AS MEMBER
220D	∋	DEAD AU 2 0	SMALL CONTAINS AS MEMBER
220E	∎	DEAD AL 3 7	END OF PROOF
220F	∏	DEAD AL M P	N-ARY PRODUCT
220F	∏	LIVE BU M	N-ARY PRODUCT
2211	∑	DEAD AL M S	N-ARY SUMMATION
2211	∑	LIVE BL M	N-ARY SUMMATION
2212	−	DEAD AL ` -	MINUS SIGN
2212	−	LIVE CU -	MINUS SIGN
2213	∓	DEAD AL ` =	MINUS-OR-PLUS SIGN
2214	∔	*HELD AU . =*	DOT PLUS
2215	∕	DEAD AL ` /	DIVISION SLASH
2215	∕	DEAD AL / SP	DIVISION SLASH
2215	∕	LIVE BU /	DIVISION SLASH
2216	∖	DEAD AL ` \	SET MINUS
2217	∗	DEAD AL 9 8	ASTERISK OPERATOR
2218	∘	DEAD AL 3 0	RING OPERATOR
2219	∙	DEAD AL 3 -	BULLET OPERATOR
221A	√	DEAD AL ` 2	SQUARE ROOT
221A	√	LIVE CU 6	SQUARE ROOT
221B	∛	DEAD AL ` 3	CUBE ROOT
221C	∜	DEAD AL ` 4	FOURTH ROOT
221D	∝	*HELD AL ` 8*	PROPORTIONAL TO

221D	∝	HYP ABC 8	PROPORTIONAL TO
221E	∞	DEAD AL ` 8	INFINITY
221E	∞	LIVE CU 7	INFINITY
221F	∟	*HELD AL 3 6*	RIGHT ANGLE
2220	∠	DEAD AL 0 .	ANGLE
2221	∡	DEAD AL 0 ,	MEASURED ANGLE
2222	∢	*HELD AL 0 ,*	SPHERICAL ANGLE
2223	∣	DEAD AL / [	DIVIDES
2224	∤	DEAD AL / \	DOES NOT DIVIDE
2225	∥	DEAD AL /]	PARALLEL TO
2226	∦	*HELD AL / *	NOT PARALLEL TO
2227	∧	DEAD AL ` 6	LOGICAL AND
2227	∧	HYP BCU ,	LOGICAL AND
2228	∨	*HELD AL ` 6*	LOGICAL OR
2228	∨	HYP BCU .	LOGICAL OR
2229	∩	DEAD AL ` 7	INTERSECTION
2229	∩	HYP ABC 6	INTERSECTION
222A	∪	*HELD AL ` 7*	UNION
222A	∪	HYP ABC 7	UNION
222B	∫	*HELD AL ` 1*	INTEGRAL
222B	∫	HYP ABC /	INTEGRAL
222C	∬	*HELD AL ` 2*	DOUBLE INTEGRAL
222D	∭	*HELD AL ` 3*	TRIPLE INTEGRAL
222E	∮	*HELD AU ` 1*	CONTOUR INTEGRAL
222F	∯	*HELD AU ` 2*	SURFACE INTEGRAL
2230	∰	*HELD AU ` 3*	VOLUME INTEGRAL
2234	∴	DEAD AL . ;	THEREFORE
2235	∵	*HELD AL . ;*	BECAUSE
2238	∸	*HELD AU . -*	DOT MINUS
223B	∻	DEAD AL ; `	HOMOTHETIC
223C	∼	DEAD AL 1 `	TILDE OPERATOR
2241	≁	DEAD AL / 1	NOT TILDE
2243	≃	DEAD AL 1 -	ASYMPTOTICALLY EQUAL TO
2243	≃	LIVE AC 6	ASYMPTOTICALLY EQUAL TO
2244	≄	*HELD AL 1 -*	NOT ASYMPTOTICALLY EQUAL TO
2245	≅	DEAD AL 1 =	APPROXIMATELY EQUAL TO

2245	≅	LIVE AC 7	APPROXIMATELY EQUAL TO
2246	≆	*HELD AU 1 =*	APPROXIMATELY BUT NOT ACTUALLY EQUAL TO
2247	≇	*HELD AL 1 =*	NEITHER APPROXIMATELY NOR ACTUALLY EQUAL TO
2248	≈	LIVE BL =	ALMOST EQUAL TO
2249	≉	DEAD AL / 2	NOT ALMOST EQUAL TO
2249	≉	LIVE AC 8	NOT ALMOST EQUAL TO
224D	≍	DEAD AL = 2	EQUIVALENT TO
2250	≐	DEAD AL . 1	APPROACHES THE LIMIT
2251	≑	DEAD AL . 2	GEOMETRICALLY EQUAL TO
2254	≔	DEAD AL ; =	COLON EQUALS
2255	≕	DEAD AL = ;	EQUALS COLON
2257	≗	*HELD AL = 8*	RING EQUAL TO
2258	≘	DEAD AL 9 =	CORRESPONDS TO
2259	≙	DEAD AL 6 =	ESTIMATES, EQUAL WITH CIRCUMFLEX ABOVE
225A	≚	*HELD AL = V*	EQUIANGULAR TO
225B	≛	DEAD AL = 8	STAR EQUALS
225C	≜	DEAD AL 4 =	DELTA EQUAL TO
225D	≝	*HELD AL = D*	EQUAL TO BY DEFINITION
225E	≞	*HELD AL = M*	MEASURED BY
225F	≟	*HELD AL / =*	QUESTIONED EQUAL TO
2260	≠	LIVE BU =	NOT EQUAL TO
2261	≡	LIVE CU =	IDENTICAL TO
2262	≢	DEAD AL / =	NOT IDENTICAL TO
2262	≢	LIVE AC 9	NOT IDENTICAL TO
2264	≤	LIVE BU ,	LESS-THAN OR EQUAL TO
2265	≥	LIVE BU .	GREATER-THAN OR EQUAL TO
2266	≦	DEAD AU , =	LESS-THAN OVER EQUAL TO
2267	≧	DEAD AU . =	GREATER-THAN OVER EQUAL TO
226A	≪	*HELD AL 3 ,*	MUCH LESS-THAN
226A	≪	*HELD AU , ,*	MUCH LESS-THAN
226B	≫	*HELD AL 3 .*	MUCH GREATER-THAN
226B	≫	*HELD AU . .*	MUCH GREATER-THAN
226D	≭	*HELD AL = 2*	NOT EQUIVALENT TO
226E	≮	DEAD AL / ,	NOT LESS-THAN
226F	≯	DEAD AL / .	NOT GREATER-THAN
2270	≰	DEAD AL , /	NEITHER LESS-THAN NOR EQUAL TO

2271	≯̸	DEAD AL . /	NEITHER GREATER-THAN NOR EQUAL TO
2272	≲	*HELD AL , =*	LESS-THAN OR EQUIVALENT TO
2273	≳	*HELD AL . =*	GREATER-THAN OR EQUIVALENT TO
2282	⊂	DEAD AL X 9	SUBSET OF
2283	⊃	DEAD AL X 0	SUPERSET OF
2284	⊄	*HELD AL X 9*	NOT A SUBSET OF
2285	⊅	*HELD AL X 0*	NOT A SUPERSET OF
2286	⊆	DEAD AU X 9	SUBSET OF OR EQUAL TO
2287	⊇	DEAD AU X 0	SUPERSET OF OR EQUAL TO
2288	⊈	*HELD AU X 9*	NEITHER A SUBSET OF NOR EQUAL TO
2289	⊉	*HELD AU X 0*	NEITHER A SUPERSET OF NOR EQUAL TO
2295	⊕	*HELD AL 0 =*	CIRCLED PLUS
2295	⊕	HYP BCU -	CIRCLED PLUS
2296	⊖	*HELD AL 0 -*	CIRCLED MINUS
2297	⊗	*HELD AL 0 8*	CIRCLED TIMES
2298	⊘	*HELD AL 0 /*	CIRCLED DIVISION SLASH
2299	⊙	*HELD AL 0 .*	CIRCLED DOT OPERATOR
229A	⊚	*HELD AU 0 .*	CIRCLED RING OPERATOR
229B	⊛	*HELD AU 0 8*	CIRCLED ASTERISK OPERATOR
229C	⊜	*HELD AU 0 =*	CIRCLED EQUALS
229D	⊝	*HELD AU 0 -*	CIRCLED DASH
22A2	⊢	DEAD AL ; 5	RIGHT TACK
22A2	⊢	DEAD AL = [	RIGHT TACK
22A3	⊣	DEAD AL =]	LEFT TACK
22A4	⊤	*HELD AL = [*	DOWN TACK
22A5	⊥	*HELD AL =]*	UP TACK
22A6	⊦	DEAD AL ; 9	ASSERTION
22A7	⊧	DEAD AL ; 0	MODELS
22A8	⊨	DEAD AL ; 6	TRUE
22A9	⊩	DEAD AL ; 7	FORCES
22AA	⊪	DEAD AL ; 2	TRIPLE VERTICAL BAR RIGHT TURNSTILE
22AB	⊫	DEAD AL ; 8	DOUBLE VERTICAL BAR DOUBLE RIGHT TURNSTILE
22AC	⊬	*HELD AL ; 5*	DOES NOT PROVE
22AD	⊭	*HELD AL ; 6*	NOT TRUE
22AE	⊮	*HELD AL ; 7*	DOES NOT FORCE
22AF	⊯	*HELD AL ; 8*	NEGATED DOUBLE VERTICAL BAR DOUBLE RIGHT TURNSTILE

22B2	⊲	DEAD AL 4 ,	NORMAL SUBGROUP OF
22B3	⊳	DEAD AL 4 .	CONTAINS AS NORMAL SUBGROUP
22B6	⊶	DEAD AL M]	ORIGINAL OF
22B7	⊷	DEAD AL M [	IMAGE OF
22B8	⊸	DEAD AL M \	MULTIMAP
22B9	⊹	*HELD AL ' =*	HERMITIAN CONJUGATE MATRIX
22BA	⊺	*HELD AL ' *	INTERCALATE
22BB	⊻	*HELD AL ` 4*	XOR
22BC	⊼	DEAD AL ` 5	NAND
22BD	⊽	*HELD AL ` 5*	NOR
22C4	⋄	DEAD AL 7 -	DIAMOND OPERATOR
22C5	⋅	DEAD AL . 8	DOT OPERATOR
22C6	⋆	DEAD AL 7 8	STAR OPERATOR
22D5	⋕	*HELD AL ' 3*	EQUAL AND PARALLEL TO
22D6	⋖	DEAD AL \ ,	LESS-THAN WITH DOT
22D7	⋗	DEAD AL \ .	GREATER-THAN WITH DOT
22D8	⋘	*HELD AU 3 ,*	VERY MUCH LESS-THAN
22D8	⋘	HYP ABC ,	VERY MUCH LESS-THAN
22D9	⋙	*HELD AU 3 .*	VERY MUCH GREATER-THAN
22D9	⋙	HYP ABC .	VERY MUCH GREATER-THAN
22EE	⋮	DEAD AL . \	VERTICAL ELLIPSIS
22EF	⋯	DEAD AL . -	MIDLINE HORIZONTAL ELLIPSIS
22F0	⋰	DEAD AU . /	UP RIGHT DIAGONAL ELLIPSIS
22F1	⋱	DEAD AU . \	DOWN RIGHT DIAGONAL ELLIPSIS
2300	⌀	LIVE AC 0	DIAMETER SIGN
2302	⌂	*HELD AU ` H*	HOUSE
2308	⌈	DEAD AL 3 [	LEFT CEILING
2309	⌉	DEAD AL 3]	RIGHT CEILING
230A	⌊	*HELD AL 3 [*	LEFT FLOOR
230B	⌋	*HELD AL 3]*	RIGHT FLOOR
2310	⌐	DEAD AL 3 6	REVERSED NOT SIGN
2318	⌘	*HELD AL ` X*	PLACE OF INTEREST SIGN
231C	⌜	DEAD AL 1 [	TOP LEFT CORNER
231D	⌝	DEAD AL 1]	TOP RIGHT CORNER
231E	⌞	*HELD AL 1 [*	BOTTOM LEFT CORNER
231F	⌟	*HELD AL 1]*	BOTTOM RIGHT CORNER

2320	⌠	DEAD AL , 4	TOP HALF INTEGRAL
2320	⌠	HYP ABC 4	TOP HALF INTEGRAL
2321	⌡	DEAD AL . 4	BOTTOM HALF INTEGRAL
2321	⌡	HYP ABC 5	BOTTOM HALF INTEGRAL
2329	〈	DEAD AL 3 ,	LEFT-POINTING ANGLE BRACKET
232A	〉	DEAD AL 3 .	RIGHT-POINTING ANGLE BRACKET
233F	⌿	DEAD AL / -	APL FUNCTIONAL SYMBOL SLASH BAR
2340	⍀	DEAD AL \ -	APL FUNCTIONAL SYMBOL BACKSLASH BAR
239B	⎛	DEAD AL , 9	LEFT PARENTHESIS UPPER HOOK
239C	⎜	DEAD AL \ 9	LEFT PARENTHESIS EXTENSION
239D	⎝	DEAD AL . 9	LEFT PARENTHESIS LOWER HOOK
239E	⎞	DEAD AL , 0	RIGHT PARENTHESIS UPPER HOOK
239F	⎟	DEAD AL \ 0	RIGHT PARENTHESIS EXTENSION
23A0	⎠	DEAD AL . 0	RIGHT PARENTHESIS LOWER HOOK
23A1	⎡	DEAD AL , [	LEFT SQUARE BRACKET UPPER CORNER
23A2	⎢	DEAD AL \ [	LEFT SQUARE BRACKET EXTENSION
23A3	⎣	DEAD AL . [	LEFT SQUARE BRACKET LOWER CORNER
23A4	⎤	DEAD AL ,]	RIGHT SQUARE BRACKET UPPER CORNER
23A5	⎥	DEAD AL \ ]	RIGHT SQUARE BRACKET EXTENSION
23A6	⎦	DEAD AL .]	RIGHT SQUARE BRACKET LOWER CORNER
23A7	⎧	*HELD AL , [*	LEFT CURLY BRACKET UPPER HOOK
23A8	⎨	*HELD AL - [*	LEFT CURLY BRACKET MIDDLE PIECE
23A9	⎩	*HELD AL . [*	LEFT CURLY BRACKET LOWER HOOK
23AA	⎪	*HELD AL \ [*	CURLY BRACKET EXTENSION
23AA	⎪	*HELD AL \ ]*	CURLY BRACKET EXTENSION
23AB	⎫	*HELD AL ,]*	RIGHT CURLY BRACKET UPPER HOOK
23AC	⎬	*HELD AL -]*	RIGHT CURLY BRACKET MIDDLE PIECE
23AD	⎭	*HELD AL .]*	RIGHT CURLY BRACKET LOWER HOOK
23AE	⎮	DEAD AL \ 4	INTEGRAL EXTENSION
23B2	⎲	*HELD AL , 4*	SUMMATION TOP
23B3	⎳	*HELD AL . 4*	SUMMATION BOTTOM
23E8	10	*HELD AU 1 0*	DECIMAL EXPONENT SYMBOL
2422	␢	DEAD AL / B	BLANK SYMBOL
2423	␣	DEAD AL 6]	OPEN BOX
2440	⑀	DEAD AL ' 0	OCR HOOK

2441	⑁	DEAD AL ' 1	OCR CHAIR
2442	⑂	DEAD AL ' 2	OCR FORK
2443	⑃	DEAD AL ' 3	OCR INVERTED FORK
2444	⑄	DEAD AL ' 4	OCR BELT BUCKLE
2445	⑅	DEAD AL ' 5	OCR BOW TIE
2446	⑆	DEAD AL ' 6	OCR BRANCH BANK IDENTIFICATION
2447	⑇	DEAD AL ' 7	OCR AMOUNT OF CHECK
2448	⑈	DEAD AL ' 8	OCR DASH
2449	⑉	DEAD AL ' 9	OCR CUSTOMER ACCOUNT NUMBER
244A	⑊	DEAD AL ' `	OCR DOUBLE BACKSLASH
2460	①	*HELD AU - 1*	CIRCLED DIGIT ONE
2461	②	*HELD AU - 2*	CIRCLED DIGIT TWO
2462	③	*HELD AU - 3*	CIRCLED DIGIT THREE
2463	④	*HELD AU - 4*	CIRCLED DIGIT FOUR
2464	⑤	*HELD AU - 5*	CIRCLED DIGIT FIVE
2465	⑥	*HELD AU - 6*	CIRCLED DIGIT SIX
2466	⑦	*HELD AU - 7*	CIRCLED DIGIT SEVEN
2467	⑧	*HELD AU - 8*	CIRCLED DIGIT EIGHT
2468	⑨	*HELD AU - 9*	CIRCLED DIGIT NINE
2469	⑩	*HELD AU = 0*	CIRCLED NUMBER TEN
246A	⑪	*HELD AU = 1*	CIRCLED NUMBER ELEVEN
246B	⑫	*HELD AU = 2*	CIRCLED NUMBER TWELVE
246C	⑬	*HELD AU = 3*	CIRCLED NUMBER THIRTEEN
246D	⑭	*HELD AU = 4*	CIRCLED NUMBER FOURTEEN
246E	⑮	*HELD AU = 5*	CIRCLED NUMBER FIFTEEN
246F	⑯	*HELD AU = 6*	CIRCLED NUMBER SIXTEEN
2470	⑰	*HELD AU = 7*	CIRCLED NUMBER SEVENTEEN
2471	⑱	*HELD AU = 8*	CIRCLED NUMBER EIGHTEEN
2472	⑲	*HELD AU = 9*	CIRCLED NUMBER NINETEEN
2473	⑳	*HELD AU ' 0*	CIRCLED NUMBER TWENTY
24EA	⓪	*HELD AU - 0*	CIRCLED DIGIT ZERO
2500	─	*HELD AL 3 H*	BOX DRAWINGS LIGHT HORIZONTAL
2502	│	*HELD AL 3 V*	BOX DRAWINGS LIGHT VERTICAL
250C	┌	*HELD AL 3 Q*	BOX DRAWINGS LIGHT DOWN AND RIGHT

2510	┐	HELD AL 3 E	BOX DRAWINGS LIGHT DOWN AND LEFT
2514	└	HELD AL 3 Y	BOX DRAWINGS LIGHT UP AND RIGHT
2514	└	HELD AL 3 Z	BOX DRAWINGS LIGHT UP AND RIGHT
2518	┘	HELD AL 3 C	BOX DRAWINGS LIGHT UP AND LEFT
251C	├	HELD AL 3 A	BOX DRAWINGS LIGHT VERTICAL AND RIGHT
2524	┤	HELD AL 3 D	BOX DRAWINGS LIGHT VERTICAL AND LEFT
252C	┬	HELD AL 3 W	BOX DRAWINGS LIGHT DOWN AND HORIZONTAL
2534	┴	HELD AL 3 X	BOX DRAWINGS LIGHT UP AND HORIZONTAL
253C	┼	HELD AL 3 S	BOX DRAWINGS LIGHT VERTICAL AND HORIZONTAL
2550	═	HELD AU 3 H	BOX DRAWINGS DOUBLE HORIZONTAL
2551	║	HELD AU 3 V	BOX DRAWINGS DOUBLE VERTICAL
2554	╔	HELD AU 3 Q	BOX DRAWINGS DOUBLE DOWN AND RIGHT
2557	╗	HELD AU 3 E	BOX DRAWINGS DOUBLE DOWN AND LEFT
255A	╚	HELD AU 3 Y	BOX DRAWINGS DOUBLE UP AND RIGHT
255A	╚	HELD AU 3 Z	BOX DRAWINGS DOUBLE UP AND RIGHT
255D	╝	HELD AU 3 C	BOX DRAWINGS DOUBLE UP AND LEFT
2560	╠	HELD AU 3 A	BOX DRAWINGS DOUBLE VERTICAL AND RIGHT
2563	╣	HELD AU 3 D	BOX DRAWINGS DOUBLE VERTICAL AND LEFT
2566	╦	HELD AU 3 W	BOX DRAWINGS DOUBLE DOWN AND HORIZONTAL
2569	╩	HELD AU 3 X	BOX DRAWINGS DOUBLE UP AND HORIZONTAL
256C	╬	HELD AU 3 S	BOX DRAWINGS DOUBLE VERTICAL AND HORIZONTAL
25A0	■	HELD AL 5 =	BLACK SQUARE
25A1	□	DEAD AL 5 =	WHITE SQUARE
25A3	▣	DEAD AL 1 7	WHITE SQUARE CONTAINING BLACK SMALL SQUARE
25AA	▪	HELD AL 5 [	BLACK SMALL SQUARE
25AB	▫	DEAD AL 5 [	WHITE SMALL SQUARE
25AC	▬	HELD AL 3 7	BLACK RECTANGLE
25B2	▲	HELD AL X ,	BLACK UP-POINTING TRIANGLE
25B4	▲	HELD AL 2 ,	BLACK UP-POINTING SMALL TRIANGLE
25B8	▶	DEAD AL 2 .	BLACK RIGHT-POINTING SMALL TRIANGLE
25BA	►	DEAD AL X .	BLACK RIGHT-POINTING POINTER
25BC	▼	HELD AL X .	BLACK DOWN-POINTING TRIANGLE
25BE	▼	HELD AL 2 .	BLACK DOWN-POINTING SMALL TRIANGLE
25C2	◀	DEAD AL 2 ,	BLACK LEFT-POINTING SMALL TRIANGLE
25C4	◄	DEAD AL X ,	BLACK LEFT-POINTING POINTER
25C6	◆	HELD AL 7 0	BLACK DIAMOND

25C7	◇	DEAD AL 7 0	WHITE DIAMOND
25C8	◈	DEAD AL 1 5	WHITE DIAMOND CONTAINING BLACK SMALL DIAMOND
25C9	◉	DEAD AL 1 9	FISHEYE
25CA	◊	DEAD AL 1 6	LOZENGE
25CB	○	DEAD AL 5 0	WHITE CIRCLE
25CC	◌	*HELD AL 0 0*	DOTTED CIRCLE
25CF	●	*HELD AL 5 0*	BLACK CIRCLE
25E6	◦	DEAD AL 3 2	WHITE BULLET
25FB	□	DEAD AL 5 \	WHITE MEDIUM SQUARE
25FC	■	*HELD AL 5 *	BLACK MEDIUM SQUARE
25FD	◻	DEAD AL 5]	WHITE MEDIUM SMALL SQUARE
25FE	◼	*HELD AL 5]*	BLACK MEDIUM SMALL SQUARE
2610	☐	DEAD AL ` B	BALLOT BOX
2611	☑	DEAD AL ` V	BALLOT BOX WITH CHECK
2612	☒	DEAD AL ` X	BALLOT BOX WITH X
2640	♀	DEAD AL ` F	FEMALE SIGN
2642	♂	DEAD AL ` M	MALE SIGN
264D	♍	DEAD AL M 5	VIRGO, MINIM/APOTHECARY
264F	♏	DEAD AL M 4	SCORPIUS, MINIM/APOTHECARY
2654	♔	DEAD AL ; K	WHITE CHESS KING
2655	♕	DEAD AL ; Q	WHITE CHESS QUEEN
2656	♖	DEAD AL ; R	WHITE CHESS ROOK
2657	♗	DEAD AL ; B	WHITE CHESS BISHOP
2658	♘	DEAD AL ; N	WHITE CHESS KNIGHT
2659	♙	DEAD AL ; P	WHITE CHESS PAWN
265A	♚	DEAD AU ; K	BLACK CHESS KING
265B	♛	DEAD AU ; Q	BLACK CHESS QUEEN
265C	♜	DEAD AU ; R	BLACK CHESS ROOK
265D	♝	DEAD AU ; B	BLACK CHESS BISHOP
265E	♞	DEAD AU ; N	BLACK CHESS KNIGHT
265F	♟	DEAD AU ; P	BLACK CHESS PAWN
2660	♠	*HELD AL 1 S*	BLACK SPADE SUIT
2663	♣	*HELD AL 1 C*	BLACK CLUB SUIT
2665	♥	*HELD AL 1 H*	BLACK HEART SUIT
2666	♦	*HELD AL 1 D*	BLACK DIAMOND SUIT
2669	♩	HYP BCU 4	QUARTER NOTE

266A	♪	HYP BCU 8	EIGHTH NOTE
266A	♪	LIVE AC M	EIGHTH NOTE
266B	♫	HYP BCU 7	BEAMED EIGHTH NOTES
266C	♬	HYP BCU 5	BEAMED SIXTEENTH NOTES
266D	♭	HYP BCU 6	MUSIC FLAT SIGN
266E	♮	HYP BCU 2	MUSIC NATURAL SIGN
266F	♯	HYP BCU 3	MUSIC SHARP SIGN
26AA	○	DEAD AL 5 9	MEDIUM WHITE CIRCLE
26AB	●	*HELD AL 5 9*	MEDIUM BLACK CIRCLE
26C0	⛀	*HELD AL ; W*	WHITE DRAUGHTS MAN
26C1	⛁	*HELD AU ; W*	WHITE DRAUGHTS KING
26C2	⛂	*HELD AL ; B*	BLACK DRAUGHTS MAN
26C3	⛃	*HELD AU ; B*	BLACK DRAUGHTS KING
2713	✓	*HELD AL ' /*	CHECK MARK
2717	✗	*HELD AL ' X*	BALLOT X
2756	❖	DEAD AL 1 4	BLACK DIAMOND MINUS WHITE X
27C7	⟇	*HELD AL \ .*	OR WITH DOT INSIDE
27D1	⟑	*HELD AL \ ,*	AND WITH DOT
27E6	⟦	*HELD AL ` [*	MATHEMATICAL LEFT WHITE SQUARE BRACKET
27E7	⟧	*HELD AL `]*	MATHEMATICAL RIGHT WHITE SQUARE BRACKET
27E8	⟨	DEAD AL ` ,	MATHEMATICAL LEFT ANGLE BRACKET
27E9	⟩	DEAD AL ` .	MATHEMATICAL RIGHT ANGLE BRACKET
27EA	⟪	*HELD AL ` ,*	MATHEMATICAL LEFT DOUBLE ANGLE BRACKET
27EB	⟫	*HELD AL ` .*	MATHEMATICAL RIGHT DOUBLE ANGLE BRACKET
290A	⤊	*HELD AL W ,*	UPWARDS TRIPLE ARROW
290B	⤋	*HELD AL W .*	DOWNWARDS TRIPLE ARROW
29E7	⧧	DEAD AL ' =	THERMODYNAMIC
29FA	⧺	DEAD AL ' -	DOUBLE PLUS
29FB	⧻	*HELD AL ' -*	TRIPLE PLUS
2A6B	⩫	DEAD AL ; 1	TILDE OPERATOR WITH RISING DOTS
2A7D	⩽	DEAD AL , =	LESS-THAN OR SLANTED EQUAL TO
2A7D	⩽	LIVE AC 4	LESS-THAN OR SLANTED EQUAL TO
2A7E	⩾	DEAD AL . =	GREATER-THAN OR SLANTED EQUAL TO
2A7E	⩾	LIVE AC 5	GREATER-THAN OR SLANTED EQUAL TO
2B25	◆	*HELD AL 7 9*	BLACK MEDIUM DIAMOND

2B26	◇	DEAD AL 7 9	WHITE MEDIUM DIAMOND
2B29	◆	*HELD AL 7 -*	BLACK SMALL DIAMOND
2C60	Ⱡ	DEAD AU 3 L	LATIN CAPITAL LETTER L WITH DOUBLE BAR
2C61	ⱡ	DEAD AL 3 L	LATIN SMALL LETTER L WITH DOUBLE BAR
2C62	Ɫ	DEAD AU 2 L	LATIN CAPITAL LETTER L WITH MIDDLE TILDE
2C63	Ᵽ	DEAD AU - P	LATIN CAPITAL LETTER P WITH STROKE
2C64	Ɽ	DEAD AU X R	LATIN CAPITAL LETTER R WITH TAIL
2C65	ⱥ	DEAD AL / A	LATIN SMALL LETTER A WITH STROKE
2C66	ⱦ	DEAD AL / T	LATIN SMALL LETTER T WITH DIAGONAL STROKE
2C67	Ⱨ	DEAD AU 5 H	LATIN CAPITAL LETTER H WITH DESCENDER
2C68	ⱨ	DEAD AL 5 H	LATIN SMALL LETTER H WITH DESCENDER
2C69	Ⱪ	DEAD AU 5 K	LATIN CAPITAL LETTER K WITH DESCENDER
2C6A	ⱪ	DEAD AL 5 K	LATIN SMALL LETTER K WITH DESCENDER
2C6B	Ⱬ	DEAD AU 5 Z	LATIN CAPITAL LETTER Z WITH DESCENDER
2C6C	ⱬ	DEAD AL 5 Z	LATIN SMALL LETTER Z WITH DESCENDER
2C6D	Ɑ	DEAD AU X A	LATIN CAPITAL LETTER ALPHA
2C6E	Ɱ	DEAD AU X M	LATIN CAPITAL LETTER M WITH HOOK
2C6F	Ɐ	DEAD AU M A	LATIN CAPITAL LETTER TURNED A
2C70	Ɒ	DEAD AU M Q	LATIN CAPITAL LETTER TURNED ALPHA
2C71	ⱱ	DEAD AL 7 V	LATIN SMALL LETTER V WITH RIGHT HOOK
2C72	Ⱳ	DEAD AU X W	LATIN CAPITAL LETTER W WITH HOOK
2C73	ⱳ	DEAD AL X W	LATIN SMALL LETTER W WITH HOOK
2C74	ⱴ	*HELD AL 8 V*	LATIN SMALL LETTER V WITH CURL
2C75	Ⱶ	DEAD AU 8 H	LATIN CAPITAL LETTER HALF H
2C76	ⱶ	DEAD AL 8 H	LATIN SMALL LETTER HALF H
2C77	ⱷ	DEAD AL 4 8	LATIN SMALL LETTER TAILLESS PHI
2C78	ⱸ	*HELD AL - E*	LATIN SMALL LETTER E WITH NOTCH
2C79	ⱹ	*HELD AL - R*	LATIN SMALL LETTER TURNED R WITH TAIL
2C7A	ⱺ	*HELD AL 8 O*	LATIN SMALL LETTER O WITH LOW RING INSIDE
2C7B	ⱻ	*HELD AU 2 E*	LATIN LETTER SMALL CAPITAL TURNED E
2C7C	ⱼ	*HELD AL 9 J*	LATIN SUBSCRIPT SMALL LETTER J
2C7D	ⱽ	*HELD AU M V*	MODIFIER LETTER CAPITAL V
2C7E	ⱷ	*HELD AU 5 S*	LATIN CAPITAL LETTER S WITH SWASH TAIL
2C7F	ⱸ	*HELD AU 5 Z*	LATIN CAPITAL LETTER Z WITH SWASH TAIL

2E0C		DEAD AL \ 8	LEFT RAISED OMISSION BRACKET
2E0D		DEAD AL / 8	RIGHT RAISED OMISSION BRACKET ???
2E17	⸗	HELD AU - -	DOUBLE OBLIQUE HYPHEN
2E18	⸘	LIVE BC 1	INVERTED INTERROBANG
2E1C		HELD AL \ 8	LEFT LOW PARAPHRASE BRACKET
2E1D		HELD AL / 8	RIGHT LOW PARAPHRASE BRACKET
2E1E	ẽ̇	HELD AL . `	TILDE WITH DOT ABOVE
2E1F	ẹ̃	HELD AL \ `	TILDE WITH DOT BELOW
2E28	⸨	HELD AL ` 9	LEFT DOUBLE PARENTHESIS
2E29	⸩	HELD AL ` 0	RIGHT DOUBLE PARENTHESIS
2E2E	⸮	HELD AU / /	REVERSED QUESTION MARK
2E32	⸲	HELD AU . ,	TURNED COMMA
2E33	⸳	DEAD AL 6 .	RAISED DOT
2E34	⸴	DEAD AL 6 ,	RAISED COMMA
2E3A	⸺	HELD AL 2 M	TWO-EM DASH
2E3B	⸻	HELD AL 3 M	THREE-EM DASH
2E40	⸚	DEAD AL 2 =	DOUBLE HYPHEN
2E40	⸚	HYP ABC -	DOUBLE HYPHEN
2E41	⸜	DEAD AL . '	REVERSED COMMA
2E42	⸞	HELD AL . '	DOUBLE LOW-REVERSED-9 QUOTATION MARK
2E4B	⸗	HELD AL 3 \	TRIPLE DAGGER (NEW)

Range U+5000 to U+5FFF

U+	Sym	Key Sequence	Description
5143	元	*HELD AL] I*	YUAN CHINESE CURRENCY INFORMAL
5186	円	*HELD AL] J*	YUAN/YEN JAPANESE CURRENCY SHINJITAI FORM
5706	圆	*HELD AL] Y*	YUAN CHINESE CURRENCY SIMPLIFIED
5713	圓	*HELD AL [Y*	YUAN CHINESE CURRENCY TRADITIONAL

Range U+A000 to U+AFFF

U+	Sym	Key Sequence	Description
A640	Ꙁ	DEAD AU ` Z	CYRILLIC CAPITAL LETTER ZEMLYA
A641	ꙁ	DEAD AL ` Z	CYRILLIC SMALL LETTER ZEMLYA
A642	Ꙁ	*HELD AU ` Z*	CYRILLIC CAPITAL LETTER DZELO
A643	ꙁ	*HELD AL ` Z*	CYRILLIC SMALL LETTER DZELO
A644	Ƨ	*HELD AU \ 2*	CYRILLIC CAPITAL LETTER REVERSED DZE
A645	ƨ	*HELD AL \ 2*	CYRILLIC SMALL LETTER REVERSED DZE
A646	Ꙇ	DEAD AU W 1	CYRILLIC CAPITAL LETTER IOTA
A647	ꙇ	DEAD AL W 1	CYRILLIC SMALL LETTER IOTA
A64A	Ꙋ	DEAD AU W 8	CYRILLIC CAPITAL LETTER MONOGRAPH UK
A64B	ꙋ	DEAD AL W 8	CYRILLIC SMALL LETTER MONOGRAPH UK
A64E	Ъ	*HELD AU 6 B*	CYRILLIC CAPITAL LETTER NEUTRAL YER
A64F	ъ	*HELD AL 6 B*	CYRILLIC SMALL LETTER NEUTRAL YER
A650	Ꙑ	*HELD AU 7 1*	CYRILLIC CAPITAL LETTER YERU WITH BACK YER
A651	ꙑ	*HELD AL 7 1*	CYRILLIC SMALL LETTER YERU WITH BACK YER
A654	Ю	DEAD AU 0 1	CYRILLIC CAPITAL LETTER REVERSED YU
A655	ю	DEAD AL 0 1	CYRILLIC SMALL LETTER REVERSED YU
A656	Ꙗ	*HELD AU 1 A*	CYRILLIC CAPITAL LETTER IOTIFIED A
A657	ꙗ	*HELD AL 1 A*	CYRILLIC SMALL LETTER IOTIFIED A
A65E	Ꙗ	DEAD AU W '	CYRILLIC CAPITAL LETTER YN
A65F	ꙗ	DEAD AL W '	CYRILLIC SMALL LETTER YN
A660	Ц	*HELD AU 6 U*	CYRILLIC CAPITAL LETTER REVERSED TSE
A660	Ц	*HELD AU \ U*	CYRILLIC CAPITAL LETTER REVERSED TSE
A661	ц	*HELD AL 6 U*	CYRILLIC SMALL LETTER REVERSED TSE
A661	ц	*HELD AL \ U*	CYRILLIC SMALL LETTER REVERSED TSE
A662	Ꙗ	*HELD AU ' D*	CYRILLIC CAPITAL LETTER SOFT DE
A663	ꙗ	*HELD AL ' D*	CYRILLIC SMALL LETTER SOFT DE
A664	Ꙗ	*HELD AU ' L*	CYRILLIC CAPITAL LETTER SOFT EL
A665	ꙗ	*HELD AL ' L*	CYRILLIC SMALL LETTER SOFT EL
A666	Ꙗ	*HELD AU ' M*	CYRILLIC CAPITAL LETTER SOFT EM
A667	ꙗ	*HELD AL ' M*	CYRILLIC SMALL LETTER SOFT EM
A69C	ъ	*HELD AL = B*	MODIFIER LETTER CYRILLIC HARD SIGN

A69D	ᵇ	*HELD AL = 6*	MODIFIER LETTER CYRILLIC SOFT SIGN
A717	˵	*HELD AL . *	MODIFIER LETTER DOT VERTICAL BAR
A718	˸	*HELD AL . /*	MODIFIER LETTER DOT SLASH
A719	˹	*HELD AL . -*	MODIFIER LETTER DOT HORIZONTAL BAR
A71A	˻	*HELD AL . 6*	MODIFIER LETTER LOWER RIGHT CORNER ANGLE
A71B	˺	*HELD AL 6 ,*	MODIFIER LETTER RAISED UP ARROW
A71C	˼	*HELD AL 6 .*	MODIFIER LETTER RAISED DOWN ARROW
A726	Ꜧ	DEAD AU M H	LATIN CAPITAL LETTER HENG
A727	ꜧ	DEAD AL M H	LATIN SMALL LETTER HENG
A728	Ꜩ	DEAD AU 5 T	LATIN CAPITAL LETTER TZ
A729	ꜩ	DEAD AL 5 T	LATIN SMALL LETTER TZ
A72A	Ꜫ	DEAD AU 8 E	LATIN CAPITAL LETTER TRESILLO
A72B	ꜫ	DEAD AL 8 E	LATIN SMALL LETTER TRESILLO
A72C	Ꜭ	DEAD AU 8 4	LATIN CAPITAL LETTER CUATRILLO
A72D	ꜭ	DEAD AL 8 4	LATIN SMALL LETTER CUATRILLO
A72E	Ꜭ,	*HELD AU 8 4*	LATIN CAPITAL LETTER CUATRILLO WITH COMMA
A72F	ꜭ,	*HELD AL 8 4*	LATIN SMALL LETTER CUATRILLO WITH COMMA
A730	F	*HELD AL X F*	LATIN LETTER SMALL CAPITAL F
A731	S	*HELD AL X S*	LATIN LETTER SMALL CAPITAL S
A732	Ꜳ	*HELD AU M 2*	LATIN CAPITAL LETTER AA
A733	ꜳ	*HELD AL M 2*	LATIN SMALL LETTER AA
A734	Ꜵ	*HELD AU M 3*	LATIN CAPITAL LETTER AO
A735	ꜵ	*HELD AL M 3*	LATIN SMALL LETTER AO
A736	Ꜷ	*HELD AU M 4*	LATIN CAPITAL LETTER AU
A737	ꜷ	*HELD AL M 4*	LATIN SMALL LETTER AU
A738	Ꜹ	*HELD AU M 5*	LATIN CAPITAL LETTER AV
A739	ꜹ	*HELD AL M 5*	LATIN SMALL LETTER AV
A73A	Ꜻ	*HELD AU M 6*	LATIN CAPITAL LETTER AV WITH HORIZONTAL BAR
A73B	ꜻ	*HELD AL M 6*	LATIN SMALL LETTER AV WITH HORIZONTAL BAR
A73C	Ꜽ	*HELD AU M 7*	LATIN CAPITAL LETTER AY
A73D	ꜽ	*HELD AL M 7*	LATIN SMALL LETTER AY
A73E	Ꝏ	DEAD AU M C	LATIN CAPITAL LETTER REVERSED C WITH DOT
A73F	ꝏ	DEAD AL M C	LATIN SMALL LETTER REVERSED C WITH DOT
A740	Ꝁ	DEAD AU - K	LATIN CAPITAL LETTER K WITH STROKE

A741	ꝁ	DEAD AL - K	LATIN SMALL LETTER K WITH STROKE
A742	Ꝃ	*HELD AU / K*	LATIN CAPITAL LETTER K WITH DIAGONAL STROKE
A743	Ꝅ	*HELD AL / K*	LATIN SMALL LETTER K WITH DIAGONAL STROKE
A744	Ꝅ	*HELD AU - K*	LATIN CAPITAL LETTER K WITH STROKE AND DIAGONAL STROKE
A745	Ꝇ	*HELD AL - K*	LATIN SMALL LETTER K WITH STROKE AND DIAGONAL STROKE
A746	ꝇ	DEAD AU 8 ;	LATIN CAPITAL LETTER BROKEN L
A747	Ꝉ	DEAD AL 8 ;	LATIN SMALL LETTER BROKEN L
A748	Ꝉ	*HELD AU - L*	LATIN CAPITAL LETTER L WITH HIGH STROKE
A749	Ꝋ	*HELD AL - L*	LATIN SMALL LETTER L WITH HIGH STROKE
A74A	Ꝋ	*HELD AU - O*	LATIN CAPITAL LETTER O WITH LONG STROKE OVERLAY
A74B	ꝋ	*HELD AL - O*	LATIN SMALL LETTER O WITH LONG STROKE OVERLAY
A74C	Ꝍ	DEAD AU 8 O	LATIN CAPITAL LETTER O WITH LOOP
A74D	ꝍ	DEAD AL 8 O	LATIN SMALL LETTER O WITH LOOP
A74E	Ꝏ	DEAD AU 8 0	LATIN CAPITAL LETTER OO
A74F	ꝏ	DEAD AL 8 0	LATIN SMALL LETTER OO
A750	Ꝑ	*HELD AU - P*	LATIN CAPITAL LETTER P WITH STROKE THROUGH DESCENDER
A751	ꝑ	*HELD AL - P*	LATIN SMALL LETTER P WITH STROKE THROUGH DESCENDER
A752	Ꝓ	DEAD AU 7 P	LATIN CAPITAL LETTER P WITH FLOURISH
A753	ꝓ	DEAD AL 7 P	LATIN SMALL LETTER P WITH FLOURISH
A754	Ꝕ	*HELD AU 7 P*	LATIN CAPITAL LETTER P WITH SQUIRREL TAIL
A755	ꝕ	*HELD AL 7 P*	LATIN SMALL LETTER P WITH SQUIRREL TAIL
A756	Ꝗ	DEAD AU - Q	LATIN CAPITAL LETTER Q WITH STROKE THROUGH DESCENDER
A757	ꝗ	DEAD AL - Q	LATIN SMALL LETTER Q WITH STROKE THROUGH DESCENDER
A758	Ꝙ	DEAD AU / Q	LATIN CAPITAL LETTER Q WITH DIAGONAL STROKE
A759	ꝙ	DEAD AL / Q	LATIN SMALL LETTER Q WITH DIAGONAL STROKE
A75A	Ꝛ	DEAD AU 8 2	LATIN CAPITAL LETTER R ROTUNDA
A75B	ꝛ	DEAD AL 8 2	LATIN SMALL LETTER R ROTUNDA
A75E	Ꝟ	DEAD AU / V	LATIN CAPITAL LETTER V WITH DIAGONAL STROKE
A75F	ꝟ	DEAD AL / V	LATIN SMALL LETTER V WITH DIAGONAL STROKE
A760	Ꝡ	*HELD AU 8 W*	LATIN CAPITAL LETTER VY
A761	ꝡ	*HELD AL 8 W*	LATIN SMALL LETTER VY
A764	Ꝥ	DEAD AU = P	LATIN CAPITAL LETTER THORN WITH STROKE
A765	ꝥ	DEAD AL = P	LATIN SMALL LETTER THORN WITH STROKE
A766	Ꝧ	*HELD AU = P*	LATIN CAPITAL LETTER THORN WITH STROKE THROUGH DESCENDER

A767	ꝑ	*HELD AL = P*	LATIN SMALL LETTER THORN WITH STROKE THROUGH DESCENDER
A768	ꝟ	DEAD AU 8 V	LATIN CAPITAL LETTER VEND
A769	ꝟ	DEAD AL 8 V	LATIN SMALL LETTER VEND
A76A	Ȝ	*HELD AU 8 3*	LATIN CAPITAL LETTER ET
A76B	ȝ	*HELD AL 8 3*	LATIN SMALL LETTER ET
A76C	ꝸ	DEAD AU 8 I	LATIN CAPITAL LETTER IS
A76D	Ꝺ	DEAD AL 8 I	LATIN SMALL LETTER IS
A76E	ꝯ	DEAD AU 8 9	LATIN CAPITAL LETTER CON
A76F	ꝯ	DEAD AL 8 9	LATIN SMALL LETTER CON
A779	Ꝺ	DEAD AU 8 D	LATIN CAPITAL LETTER INSULAR D
A77A	ꝺ	DEAD AL 8 D	LATIN SMALL LETTER INSULAR D
A77B	Ꝼ	DEAD AU 8 F	LATIN CAPITAL LETTER INSULAR F
A77C	ꝼ	DEAD AL 8 F	LATIN SMALL LETTER INSULAR F
A77D	Ᵹ	DEAD AU 8 G	LATIN CAPITAL LETTER INSULAR G
A77E	Ꞿ	*HELD AU 8 G*	LATIN CAPITAL LETTER TURNED INSULAR G
A77F	ꞿ	*HELD AL 8 G*	LATIN SMALL LETTER TURNED INSULAR G
A780	Ꞹ	DEAD AU 0 L	LATIN CAPITAL LETTER TURNED L
A781	ꞹ	DEAD AL 0 L	LATIN SMALL LETTER TURNED L
A782	Ꞅ	DEAD AU 8 R	LATIN CAPITAL LETTER INSULAR R
A783	ꞅ	DEAD AL 8 R	LATIN SMALL LETTER INSULAR R
A784	Ꞃ	DEAD AU 8 S	LATIN CAPITAL LETTER INSULAR S
A785	ꞃ	DEAD AL 8 S	LATIN SMALL LETTER INSULAR S
A786	Ꞇ	DEAD AU 8 T	LATIN CAPITAL LETTER INSULAR T
A787	ꞇ	DEAD AL 8 T	LATIN SMALL LETTER INSULAR T
A788	ˬ	AL 6 BL 6	MODIFIER LETTER LOW CIRCUMFLEX ACCENT
A788	ˬ	DEAD AL [SP	MODIFIER LETTER LOW CIRCUMFLEX ACCENT
A789	˸	DEAD AL M ;	MODIFIER LETTER COLON
A78A	꞉	*HELD AU - =*	MODIFIER LETTER SHORT EQUALS SIGN
A78B	ꞌ	DEAD AL ']	LATIN CAPITAL LETTER SALTILLO
A78B	ꞌ	*HELD AL ']*	LATIN CAPITAL LETTER SALTILLO
A78C	ꞌ	DEAD AL ' [	LATIN SMALL LETTER SALTILLO
A78C	ꞌ	*HELD AL ' [*	LATIN SMALL LETTER SALTILLO
A78D	Ɥ	DEAD AU X 4	LATIN CAPITAL LETTER TURNED H
A78E	ꞎ	DEAD AL 7 L	LATIN SMALL LETTER L WITH RETROFLEX HOOK AND BELT

A790	Ꞑ	DEAD AU 5 N	LATIN CAPITAL LETTER N WITH DESCENDER
A791	ꞑ	DEAD AL 5 N	LATIN SMALL LETTER N WITH DESCENDER
A792	Ꞓ	DEAD AU - C	LATIN CAPITAL LETTER C WITH BAR
A793	ꞓ	DEAD AL - C	LATIN SMALL LETTER C WITH BAR
A794	ꞔ	*HELD AL 0 C*	LATIN SMALL LETTER C WITH PALATAL HOOK
A795	ꞕ	*HELD AL 0 H*	LATIN SMALL LETTER H WITH PALATAL HOOK
A796	Ꞗ	DEAD AU 7 B	LATIN CAPITAL LETTER B WITH FLOURISH
A797	ꞗ	DEAD AL 7 B	LATIN SMALL LETTER B WITH FLOURISH
A798	Ꞙ	DEAD AU - F	LATIN CAPITAL LETTER F WITH STROKE
A799	ꞙ	DEAD AL - F	LATIN SMALL LETTER F WITH STROKE
A7A0	Ꞡ	DEAD AU / G	LATIN CAPITAL LETTER G WITH OBLIQUE STROKE
A7A1	ꞡ	DEAD AL / G	LATIN SMALL LETTER G WITH OBLIQUE STROKE
A7A2	Ꞣ	DEAD AU / K	LATIN CAPITAL LETTER K WITH OBLIQUE STROKE
A7A3	ꞣ	DEAD AL / K	LATIN SMALL LETTER K WITH OBLIQUE STROKE
A7A4	Ꞥ	DEAD AU / N	LATIN CAPITAL LETTER N WITH OBLIQUE STROKE
A7A5	ꞥ	DEAD AL / N	LATIN SMALL LETTER N WITH OBLIQUE STROKE
A7A6	Ꞧ	DEAD AU / R	LATIN CAPITAL LETTER R WITH OBLIQUE STROKE
A7A7	ꞧ	DEAD AL / R	LATIN SMALL LETTER R WITH OBLIQUE STROKE
A7A8	Ꞩ	DEAD AU / S	LATIN CAPITAL LETTER S WITH OBLIQUE STROKE
A7A9	ꞩ	DEAD AL / S	LATIN SMALL LETTER S WITH OBLIQUE STROKE
A7AA	Ɦ	DEAD AU X H	LATIN CAPITAL LETTER H WITH HOOK
A7AB	Ɜ	DEAD AU X 3	LATIN CAPITAL LETTER REVERSED OPEN E
A7AC	Ɡ	DEAD AU M G	LATIN CAPITAL LETTER SCRIPT G
A7AD	Ɬ	DEAD AU ; L	LATIN CAPITAL LETTER L WITH BELT
A7AD	Ɬ	DEAD AU X L	LATIN CAPITAL LETTER L WITH BELT
A7AE	ɪ	*HELD AU X I*	LATIN CAPITAL LETTER SMALL CAPITAL I (NEW)
A7AF	ǫ	*HELD AL X Q*	LATIN LETTER SMALL CAPITAL Q (NEW)
A7B0	Ʞ	DEAD AU 0 K	LATIN CAPITAL LETTER TURNED K
A7B1	Ʇ	DEAD AU 0 T	LATIN CAPITAL LETTER TURNED T
A7B2		DEAD AU X J	LATIN CAPITAL LETTER J WITH CROSSED-TAIL
A7B3	Χ	DEAD AU M X	LATIN CAPITAL LETTER CHI
A7B4	Β	DEAD AU M B	LATIN CAPITAL LETTER BETA
A7B5	β	DEAD AL M B	LATIN SMALL LETTER BETA
A7B6	Ω	DEAD AU 4 W	LATIN CAPITAL LETTER OMEGA
A7B7		DEAD AL 4 W	LATIN SMALL LETTER OMEGA

A7B8	Ꞓ	DEAD AU / U	LATIN CAPITAL LETTER U WITH DIAGONAL STROKE (NEW)
A7B9	ꞓ	DEAD AL / U	LATIN SMALL LETTER U WITH DIAGONAL STROKE (NEW)
A7C0	Ꝿ	DEAD AU / P	LATIN CAPITAL LETTER THORN WITH DIAGONAL STROKE (NEW)
A7C1	ꝿ	DEAD AL / P	LATIN SMALL LETTER THORN WITH DIAGONAL STROKE (NEW)
A7F8	ꟸ	HELD AU - H	MODIFIER LETTER CAPITAL H WITH STROKE
A838	꠸	HELD AL [J	NORTH INDIC CURRENCY: RUPEE MARK
AB33	ꬳ	DEAD AL - E	LATIN SMALL LETTER BARRED E
AB34	ꬴ	DEAD AL 7 F	LATIN SMALL LETTER E WITH FLOURISH
AB35	ꬵ	HELD AU M F	LATIN SMALL LETTER LENIS F
AB36	ꬶ	HELD AL 8 H	LATIN SMALL LETTER SCRIPT G WITH CROSSED-TAIL
AB38	ꬸ	HELD AL 2 L	LATIN SMALL LETTER L WITH DOUBLE MIDDLE TILDE
AB39	ꬹ	HELD AL 8 L	LATIN SMALL LETTER L WITH MIDDLE RING
AB3A	ꬺ	HELD AL 8 M	LATIN SMALL LETTER M WITH CROSSED-TAIL
AB3B	ꬻ	HELD AL 8 N	LATIN SMALL LETTER N WITH CROSSED-TAIL
AB49	ꭉ	HELD AL 8 R	LATIN SMALL LETTER R WITH CROSSED-TAIL
AB52	ꭒ	HELD AL 5 U	LATIN SMALL LETTER U WITH LEFT HOOK
AB53	χ	DEAD AL M X	LATIN SMALL LETTER CHI
AB5C	ꭜ	HELD AL ` H	MODIFIER LETTER SMALL HENG
AB61	ꭡ	HELD AL 0 I	LATIN SMALL LETTER IOTIFIED E
AB63	ꭣ	HELD AL 0 U	LATIN SMALL LETTER UO

Range U+F000 to U+1FFFF

U+	Sym	Key Sequence	Description
FB00	ﬀ	*HELD AL 3 F*	LATIN SMALL LIGATURE FF
FB01	ﬁ	*HELD AL 3 I*	LATIN SMALL LIGATURE FI
FB02	ﬂ	*HELD AL 3 L*	LATIN SMALL LIGATURE FL
FB03	ﬃ	*HELD AU 3 I*	LATIN SMALL LIGATURE FFI
FB04	ﬄ	*HELD AU 3 L*	LATIN SMALL LIGATURE FFL
FB05	ﬅ	*HELD AU 8 F*	LATIN SMALL LIGATURE LONG S T
FB06	ﬆ	*HELD AU 8 S*	LATIN SMALL LIGATURE ST
FDFC	﷼	*HELD AL] R*	RIAL SIGN; this is a Right-to-Left character
FFFD	⍰	*HELD AU / R*	REPLACEMENT CHARACTER
1F12F	(ɔ)	HYP BCU '	COPYLEFT SYMBOL (NEW)

End of Help

The ***Q*** International QWERTY Keyboard

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The Q Keyboard user community is supported by the online forum located at
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