

# A C'HWERTY keyboard for the Breton speakers and the polyglots.



## 1. Overview of the computer keyboard.

A new computer keyboard with a C'HWERTY layout is now available for sale.

Its main aim is to satisfy Breton speakers' needs. This product is the answer of a stronger and stronger demand amongst this community. The keyboard takes into account the linguistic specificities of Breton and the new features recently introduced by the international norm ISO-8859-15, « Latin 9 » also called sometimes « Latin 0 ».

The C'HWERTY keyboard is directly adapted from the French AZERTY keyboard. The main feature is that it handles four new keys **C'H CH Û** and **Ñ** in order to allow user-friendly text inputs in Breton.

Because we also chose to ensure user-friendly text inputs in French, the 3 keys **C Q** and **X**, rarely used in Breton, have been also preserved. In the same way, direct access to the French diacritics **à ç è é** classically present on the AZERTY keyboard has been maintained.

This keyboard perfectly applies to the latest norm « ISO-8859-15 » and allocates a key to the new **€ œ Œ** and **ÿ** characters. As a bonus, it provides a direct access to **É æ Æ « » ç** and to other numerous characters that can be very useful to polyglots. In particular it handles all the diacritic characters of all Celtic languages, Welsh, Irish, Scottish, Cornish and Manx.

The keyboard driver is available for Windows 2000 and XP.

### Trilingual table of labels for the C'HWERTY keyboard.

Breton	French	English
<b>Achap</b>	Échappement	Escape
<b>Taolennata</b>	Tabulation	Tabulation
<b>Prennañ Pennlizherenn</b>	Verrouillage Majuscule	Caps Lock
<b>Pennlizherenn</b>	Majuscule	Shift
<b>Reol</b>	Contrôle	Control
<b>Erlec'hiañ</b>	Alternatif	Alternate
<b>Souzañ</b>	Retour	Backspace
<b>Enankañ</b>	Entrée	Enter
<b>Arouezenn Erlec'hiañ</b>	Graphique Alternatif	Alternate Graphics
<b>Ensoc'hañ</b>	Insérer	Insert
<b>Dilemel</b>	Supprimer	Delete
<b>Dibenn</b>	Fin	End
<b>Moulañ Skramm</b>	Impression Écran	Print Screen
<b>Arsav Dibuniñ</b>	Arrêt défilement	Scroll Lock
<b>Ehan</b>	Pause	Pause
<b>Span</b>	Attente	Break
<b>Prennañ sifrennoù</b>	Verrouillage Numérique	Numeric Lock
<b>Kewerienn<sup>1</sup> (K1,...)</b>	Fonction (F1, ...)	Function (F1, ...)
<b>Deroù</b>	Origine	Home
<b>Paj. Adreñv</b>	Page précédente	Page up
<b>Paj. A-raok</b>	Page suivante	Page down
<b>Dihun</b>	Réveille	Wake up
<b>Kousk</b>	Veille	Sleep
<b>Lazh</b>	Éteindre	Power off

<sup>1</sup> = Arc'hwel

## 2. Six good reasons why you should update your old AZERTY.

Who is targeted by this product? What are the main advantages?

- **Handle Breton speakers' needs.**

The C'HWERTY keyboard has four new and distinctive keys **C'H CH Û** and **Ñ** which are really needed for a user-friendly text input in Breton. The other diacritic characters of the language (**ê, ü ...**) can be caught more classically by pressing the *dead* key of the accent needed (**^ " `**) before pressing the key of the base character to modify. For instance, the **ê** of **kêr** can be traditionally caught by pressing successively the characters **^** and **e**.

The supported spelling systems are unified Breton as well as the inter-dialectal system. The « university system » or the « falhuneg » system, which appear less and less used nowadays, will not take any substantial profit of these new features.

All the meta-keys of the C'HWERTY keyboard are printed in Breton. Not only a real tool for promoting the Breton language, it will also respond to all your needs in computer assisted data inputs ...

- **Enhance the AZERTY keyboard and satisfy the French speakers.**

The C'HWERTY keyboard handles the latest international norm « ISO-8859-15 » (Latin-9) and allocates a key or gives a direct access to **€ œ Œ** and **ÿ**. Other ISO-8859-1 characters, previously forgotten by the AZERTY keyboard but really necessary in French as **æ Æ Ç « »** have also their dedicated key.

Examples of French words including the **œ** ligature:

*Bœuf, cœlome, cœlacanthe, cœliaque, cœur, chœur, foetus, manœuvre, mœurs, nœud, œcuménisme, œdème, œdipien, œil, œillade, œillets, œnologie, œsophage, œuf, œuvre, sœur, vœu, stœchiométrie, ...*

Examples of places of Brittany including the **œ** ligature:

*Plœmel, Plœuc-sur-Lié, Plœmeur, Plœren, Le Fœil, Paimbœuf, Bonnœuvre, Hœdic, ...*

Examples of French words coming from Latin including the **æ** ligature:

*Lætitia, ægosome, cæcum, uræus, æsthésiometre, cælostat, cæruleum, cæsium, dæmonorops, althæa, cobæa, æschne, æpyornis, et cætera, ...*

The « and » characters are the **French** guillemots and are not directly and easily accessible from an AZERTY keyboard. Some software like the word processor *Microsoft Word*, can replace the " , **English** guillemot or double quote, by its French equivalents but this treatment is rarely handled by common software.

Let's recall again that the capitals **É** and **Ç** are also not directly accessible from the French AZERTY keyboard. Only the automatic correction of the text by your software can render properly these characters, for example if one of these letters is the first one of a word located at the beginning of a sentence.

The **ÿ** is only used in proper nouns, mainly towns or family names like the well known **MOÿ**, **HAY-LES-ROSES**, **Aÿ** or **CROÿ**, **LOUÿS ...**

- **Handle correctly all the Celtic languages diacritics.**

With the C'HWERTY keyboard you can access very easily all the diacritics of the 6 Celtic languages. It handles the norm UNICODE 2.0 which has officially standardized the latest diacritic codes that were not yet defined.

These special characters, which are available by default for the main majority of them with the operating systems Windows 2000/XP, are:

« Super Unified » Breton

Ââ Êê Ññ Ùù Ûû Üü ' ,

Unified Cornish [needs a UNICODE Latin Extended-B font for the y. cf. FAQ]

Āā Ēē Īī Ōō Ūū Üü Ūȳ

Irish Gaelic

Áá Éé Íí Óó Úú

Older Irish Gaelic [needs a UNICODE Latin-8. font cf. FAQ]

Áá ßß Ćć Ďď Éé Ĥĥ Šš Íí Ğğ Óó Ğğ Šš Ćć Úú ı ı ı ı

Manx Gaelic

Çç

Scottish Gaelic

Àà Èè Éé Ìì Òò Óó Ùù

Welsh

Àà Áá Ââ Ää Èè Éé Ěě Ìì Íí Îî Īī Òò Óó Ôô Öö  
Ùù Úú Ûû Üü Õõ Ŵŵ Ŷŷ ÿÿ Ŷÿ Ŷÿ

The C'HWERTY keyboard allows a friendly input of all these characters. As an example, it will render properly the older Irish character ß via the key combination **` + b** or the Welsh character ŵ via **^ + w** as well.

The same key combinations on an AZERTY keyboard would produce `b or ^w!

The *macron* dead key **`** and *dot above* **´** are new ones. They allow the input for Cornish and older Irish diacritics.

Example of Gaelic text:

“Ó ní gáðad ðuit é, a Břrígíd,” ars’ an ðráctair eile go searð.  
Ó n lá sain go dtí an lá indiu tá Caiín na mBřráitře mar ainm  
ar éinne a ðíonn “cun é sin déanam” i n-ionad é ðeic déanta ...

- **Handle the indivisible space.**

With this keyboard you can easily insert an indivisible space by pressing the key combination « **SHIFT+ALTGR+SPACE BAR** ». This feature is useful if you wish to have one segment of your text indivisible at the level of its spaces.

In particular if you publish WEB pages, it will avoid that a character located at the end of a sentence, like for example the French guillemot » or the punctuation mark ..., gets misplaced at the beginning of the following line. This can occur if your text is read from a computer machine whose screen size or WEB browser size is variable as well as the presence of substitution fonts.

- **Handle other numerous European languages.**

When using an AZERTY keyboard, you have an access to the French é diacritic character, to the Portuguese characters õ and ã or to the Spanish ñ. Please note that the access to á í ó ú ... also required for these latter languages, is definitely missing on this keyboard.

The C'HWERTY keyboard is better tailored to handle the languages that use accented vowels with acute accent. We can list amongst them numerous Latin languages including Gallo, Spanish, Italian, Portuguese, Galician, Catalan, Asturian, Occitan, Frioulian ... but also Dutch, Frisian or Luxemburgish.

Table of all the other diacritics useful for various languages:

	<b>Access</b>	<b>Name</b>	<b>Language(s)</b>
Å å	· + A	A round	Danish Swedish Norwegian Walloon
Ø ø	· + O	O stroke	Danish Norwegian Faroese Ligurian
Ð ð	˘ + D	Eth	Icelandic Faroese
Þ þ	˘ + T	Thorn	Icelandic
L l	· + L	L geminated	Catalan
Ħ ħ	˘ + H	H stroke	Maltese
Ż ż	· + Z	Z dot above	Maltese (with also c and g dot above )
Í í	˘ + I	I tilde	Greenlandic
Ũ ã	˘ + U	U tilde	Greenlandic
Ĉ ĉ	^ + C	C circumflex	Esperanto
Ŝ ŝ	^ + S	S circumflex	Esperanto
Ĝ ĝ	^ + G	G circumflex	Esperanto
Ĥ ĥ	^ + H	H circumflex	Esperanto
Ĵ ĵ	^ + J	J circumflex	Esperanto
Ŭ ŭ	· + U	U breve	Esperanto
Ñ ñ	˘ + N	N acute	Beti (Cameroon)
Ŷ ŷ	˘ + Y	Y tilde	Toba (Indonesia)

Please note that the availability of the *macron* ˘ dead key allows the rendering of Polynesian languages.

- **Access to Greek, mathematical, business ... characters.**

As a bonus the C'HWERTY keyboard gives a direct access to the ¡ ¸ © ® ¢ ¥ £ characters which can be very useful in certain circumstances.

The following characters are also easily accessible, even if most of them have not been printed on the keys in order not to overload the general aspect of the computer keyboard:

α β γ δ ε ζ η θ ι κ λ μ ν ξ ο π ρ ς σ τ υ φ χ ψ ω

Γ Δ Θ Λ Ξ Π Σ Φ Ω

± ∓ ÷ × ¼ ½ ¾ ⅓ ⅔ ⅛ ⅜ ⅝ ⅞ ≤ ≥ ≠ ∞

### 3. FAQ – Frequently Asked Questions.

- Which capitals for the polygraphs **ch** and **c'h**? **CH/C'H** or **Ch/C'h**?

Nothing is really clear in the Breton literature about the way we should write the Breton polygraphs **ch** and **c'h** in uppercase. Should we write **CH** and **C'H** or **Ch** and **C'h**? As a compromise we chose to give an access to the **CH** and **C'H** characters when the SHIFT key is pressed but also to **C'h** and **Ch** if the meta-key ALTGR is activated.

- Why are not the polygraphs made of a unique character?

The UNICODE consortium recently gave a code to the Dutch digraph **IJ** (and **ij**) cf. the town of **Ijmegen**, spelled this way on the panel at the entry of the town. This character whose code is U0132 is unique, this means that it is not composed of the two successive characters **I** and **J**.

Can we hope that in the short future the consortium will give its codes to the Breton polygraphs? The answer is likely **no**, because the consortium recently published a note saying that no more polygraph will be handled unless you can provide them with a really good reason.

Breton is not the only language concerned by this restriction. Gaelic, Slovak but above all Welsh have digraphs in their alphabets. So the consequence here is that when you will press the **CH** and **C'H** keys on the C'HWERTY keyboard, several characters will be produced.

- Which « skrab » character for C'H ?

Several characters can be used to render the « skrab » of C'H. We chose according to Roparz Hémon and Fañch Kervella's typographic rules to use the left leaned right quote, rather than the common apostrophe. Hence we shall write **PLOUMANAC'H** rather than **PLOUMANAC'H**.

- Are special characters fonts needed to properly render some languages?

Yes. If you want to write properly older Irish or the  $\bar{c}$  character of Unified Cornish, you will need UNICODE Latin-8 compliant or Latin Extended-B compliant fonts, respectively.

There are several of them available for free, they can be downloaded on the Internet and are also present on the driver CDROM provided with the C'HWERTY keyboard. For the other diacritics, all the standard fonts, standard but up to date, (Arial, Times New Roman, Verdana, Comics ...) are sufficient nowadays.

<http://czyborra.com/charsets/iso8859.html>    <http://www.alanwood.net/unicode/fonts.html>  
<http://www.slovo.info/unifonts.htm>    [http://www.geocities.com/finis\\_stellae/ng/unicode.html](http://www.geocities.com/finis_stellae/ng/unicode.html)  
<http://www.drouizig.org/drouizig/keneliadou/>

- The ISO-8859-15 norm, UNICODE, Internet and software compatibility.

The ISO-8859-15 norm and UNICODE are emerging norms, and you probably notice it already when using the € character, some older or Anglo-American software do not handle it properly.

There is a hope that in the near future most of the software used in the world will handle correctly these novelties. The coherence of all the data which is bigger and bigger over the Internet will depend on it crucially.

In the meantime, if you have a doubt about the « outdatedness » of your pals' software or hardware there is no magic solution, as a work-around, always prefer to employ **EUR** instead of € or **oe** instead of œ etc.

- Handling other operating systems, 95/98/Me, Linux, Macintosh?

Linux and Macintosh could be handled in the future. This mostly depends on the demand we shall receive for them. Taking into account the other windows versions, 95/98/ME, can be considered. Although they will always work with 8 bits characters pages that will always be a limitation. NT4 is not handled because the windows NT4 kernel does not handle keyboard drivers that define ligatures. (Only 2000 and XP).

#### 4. Trilingual vocabulary of computer keyboard and orthography.

Brezhoneg	Galleg	Saozneg
lizherenn	lettre	letter
niver/niverenn	nombre	number/digit
arouezenn/nod	caractère	character
klavier	clavier	keyboard
stokell	touche	key
stokell arc'hwel/gewerienn	touche de fonction	function key
stokell zu	touche de direction	direction key
stokell badus	touche rémanente	meta key
berradennoù klavier	raccourci clavier	hot key
stokell erlec'hiañ	touche de commutation	meta key
stokell varv	touche morte	dead key
esaou/gwenn	espace	space

tired	accent	accent
arouezenn-diforc'h	diacritique	diacritic
daouboent	tréma	colon
lostig	cédille	cedilla
tired kognek	circonflexe	circumflex
makroñs/tired a-us	macron/tiret en chef	macron
pik a-us	point en chef	dot above
ereadur	ligature	ligature
liesgraf	polygraphe	polygraph
divgraf	digraphe	digraph
tired lemm	aigu	acute
tired boud	grave	grave
skej	virgule	coma
daou bik	deux points	colon
pik	point	full stop/dot/period
tri fik	point de suspension	suspension mark
pik-skejig	point virgule	semi colon
pik-estlamm	point d'exclamation	exclamation mark
pik-goulenn	point d'interrogation	question mark
mui	plus	plus
tired	tiret	hyphen
tired izel	tiret bas	underscore
nemet/lei	moins	minus
lieskementet/gwech	multiplié/fois	time
rannet	divisé	divided by
tildenn	tilde	tilde
krochedigoù	guillemets	double quote
merkezenn	cote	quote/quotation mark
krommell	parenthèses	brackets
krommell digeriñ	parenthèse ouvrante	open bracket
krommell serriñ	parenthèse fermante	close bracket
krochedoù	crochets	square brackets
briataennoù	accolades	braces/curlies (left & right)
barrenn a-dreuz	barre oblique	forward slash
barrenn a-dreuz gin	barre oblique inversée	back slash
barrenn a-seizh/a-sonn	barre verticale	vertical bar
diezenn	dièse	hash
« ha » kenwerzhel	esperluette	ampersand
skrab	apostrophe	apostrophe
asterisk/steredennig	astérisque	asterisk
krogenn	arobe	at sign
zo par da/par	égal	equal
mac'her	exposant	exponent
feuriader	indice	index
dreist da/brasoc'h da	supérieur à	greater than
brasoc'h eget pe bar da	supérieur ou égal	greater than or equal
bihanoc'h eget	inférieur à	less than
bihanoc'h eget pe bar da	inférieur ou égal	less than or equal
disheñvel ouzh	différent de	different from
dre-gant	pourcent	percent
ereadur o/e	e collé dans l'o	o/e ligature
pennlizherenn	majuscule	upper case
lizherenn vunut	minuscule	lower case
lizherenn gentañ	initiale	initial
pennlizherenn	capitale	capital
keneliad/polisenn	police	font
tev	gras	bold
stouet	italique	italic

islinennet	souigné	underlined
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**Annexe A - Table of UNICODE indexes for diacritic characters.**

á	0x00e1	Á	0x00c1	Irish Welsh
é	0x00e9	É	0x00c9	Irish Welsh Scottish French
í	0x00ed	Í	0x00cd	Irish Welsh
ó	0x00f3	Ó	0x00d3	Irish Welsh Scottish
ú	0x00fa	Ú	0x00da	Irish Welsh
ý	0x00fd	Ý	0x00dd	Welsh
ŵ	0x1e83	Ŵ	0x1e82	Welsh
à	0x00e0	À	0x00c0	Welsh Scottish French
è	0x00e8	È	0x00c8	Welsh Scottish French
ì	0x00ec	Ì	0x00cc	Welsh Scottish
ò	0x00f2	Ò	0x00d2	Welsh Scottish
ù	0x00f9	Ù	0x00d9	Breton Welsh Scottish French
ÿ	0x1ef3	Ÿ	0x1ef2	Welsh
ẁ	0x1e81	Ẅ	0x1e80	Welsh
â	0x00e2	Â	0x00c2	Breton Welsh French
ê	0x00ea	Ê	0x00ca	Breton French
î	0x00ee	Î	0x00ce	Welsh French
ô	0x00f4	Ô	0x00c4	Welsh French
û	0x00fb	Û	0x00db	Welsh French
ÿ	0x0177	Ÿ	0x0174	Welsh
ẁ	0x0175	Ẅ	0x0176	Welsh
ä	0x00e4	Ä	0x00c4	Welsh
ë	0x00eb	Ë	0x00cb	Welsh French
ï	0x00ef	Ï	0x00cf	Welsh French
ö	0x00f6	Ö	0x00d6	Welsh
ü	0x00fc	Ü	0x00dc	Breton Cornish Welsh French
ÿ	0x00ff	Ÿ	0x0178	Welsh
ẁ	0x1e85	Ẅ	0x1e84	Welsh
ā	0x0101	Ā	0x0100	Cornish
ē	0x0113	Ē	0x0112	Cornish
ī	0x012b	Ī	0x012a	Cornish
ō	0x014d	Ō	0x014c	Cornish
ū	0x016b	Ū	0x016a	Cornish
ȳ	0x0233	Ȳ	0x0232	Cornish
ç	0x00e7	Ç	0x00c7	Manx French
ñ	0x00f1	Ñ	0x00d1	Breton
æ	0x00e6	Æ	0x00c6	French
œ	0x0153	Œ	0x0152	French
ḃ	0x1e03	Ḅ	0x1e02	Irish
ċ	0x010b	Ċ	0x010a	Irish
ḍ	0x1e0b	Ḍ	0x1e0a	Irish
ḟ	0x1e1f	Ḟ	0x1e1e	Irish
ḟ	0x0121	Ḟ	0x0120	Irish
ḿ	0x1e41	Ṁ	0x1e40	Irish
Ṗ	0x1e57	Ṙ	0x1e56	Irish
Ṣ	0x1e61	Ṥ	0x1e60	Irish
Ṭ	0x1e6b	Ṯ	0x1e6a	Irish
Ṛ	0x027c			Irish
Ṛ	0x017f			Irish
Ṛ	0x1e9b			Irish

**Annexe B** - Table of all characters accessible from the **C'HWERTY** Breton computer keyboard.

Achap	K1	K2	K3	K4	K5	K6	K7	K8	K9	K10	K11	K12	
~ Γ	1 Δ	2 Θ	3 Λ	4 Ξ	5 Π	6 Σ	7 Φ	8 Ψ	9 Ç	0 Ω	- ß	+ ¬ ←	
² ·	& -	é ´	" #	' {	( [	-	è `	_ \	ç ±	à @	) ]	= }	
Taolenn	C'H α c'h C'h	W ω w	E ε e €	R ρ r ϱ	T τ t	Y ψ y	U υ u	I ι i ι	O Œ o œ	P π p	ˆ ¥	* £	« / »
Prenn Pennli	A Æ a æ	S σ s ς	D δ d \$	F φ f	G γ g	H η h	J ζ j	K κ k	L λ l	M μ m	Ù ® ù	! ¡ ?	¿
Pennli	Q θ q <	Z ζ z >	X ξ x	C χ c ϸ	V ᵃ v	B β b	N ν n	CH o ch Ch	Ñ ° ñ	: © . §	; % , %	Pennlizherenn	
Reol	Erl									ArErl	Reol		

- Optimal user-friendliness for data input of Breton texts (new dedicated keys **C'H**, **CH**, **Ñ** and **Ù**).
- Full labelling of meta-keys in Breton (**Reol**, **Erl**, **ArErl**, **Enankañ**, **Souzañ**, **Ensoc'hañ**, **Arsav Dibuniñ**, ...).
- Coding of diacritics and new characters compliant to the emerging norm 16bits **UNICODE**.
- **AZERTY** keyboard enriched to suit French speakers and Latin languages speakers' needs (keys or access to **œ**, **Œ**, **æ**, **Æ**, **ÿ**, **É**, **Ç**, **«**, **»**, **á**, **í**, **ó**, **ú** ...).
- Handling of all Celtic languages, acces to diacritics **ŵ**, **ŷ**, **ã**, **ẽ**, **ḃ**, **ḅ**, **ḟ** ... and ϱ ϱ, allonged **s** and **r** for older Irish.
- As a bonus, numerous Greek (**α β γ** ...), business (**€ ¥ £** ...) and science (**± ∓ ≤ ≥ ∞ ≠** ...) characters.

Annexe C – Specification of the C'HWERTY keyboard.

52TA - BZH

REV: A

Date: 21 03, 2003

CHK:

CHK:

APP'D:

