

Les claviers

ErgoDox

Olivier Pons / 2015

Claviers / Ergodox

Objectif

Avoir une nouvelle vision du clavier

Sommaire

1. Historique
2. Ergodox
3. Touches mécaniques
4. Ma configuration

Claviers / Ergodox

1 – Historique

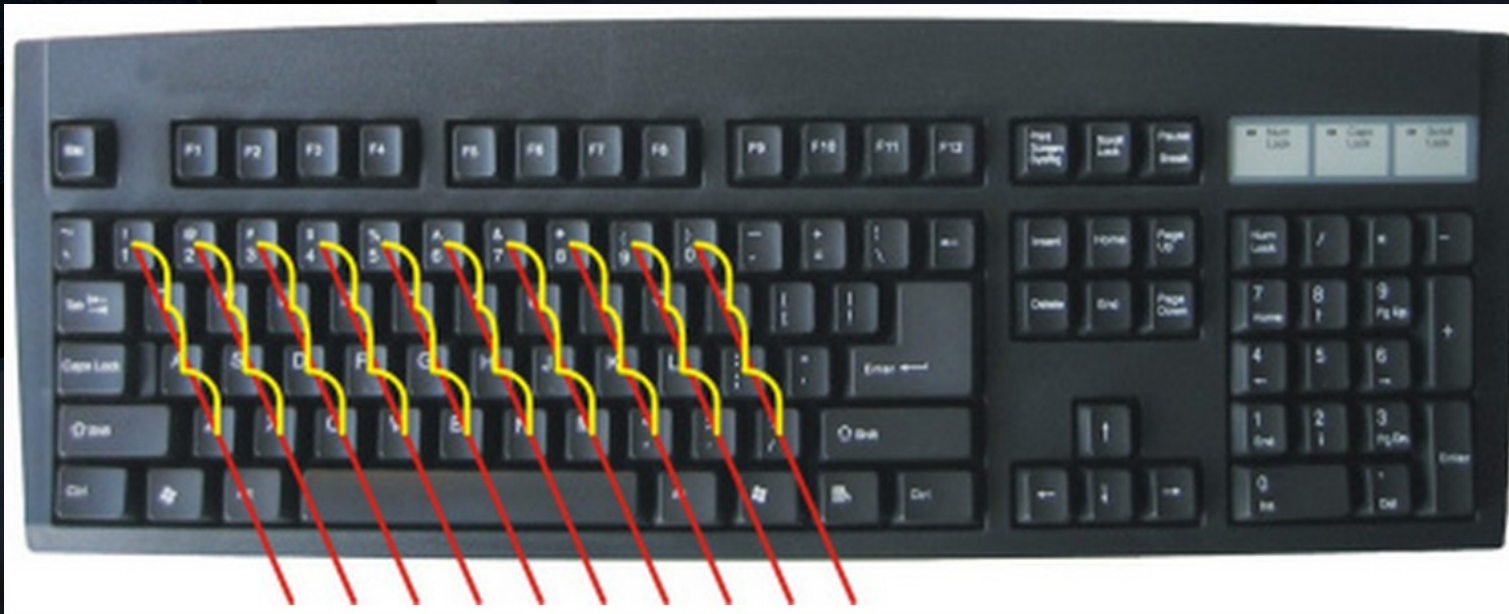
a – 1860's



Claviers / Ergodox

1 – Historique

b – Aujourd'hui



Rien n'a changé !

Claviers / Ergodox

1 – Historique

c – Nouveautés

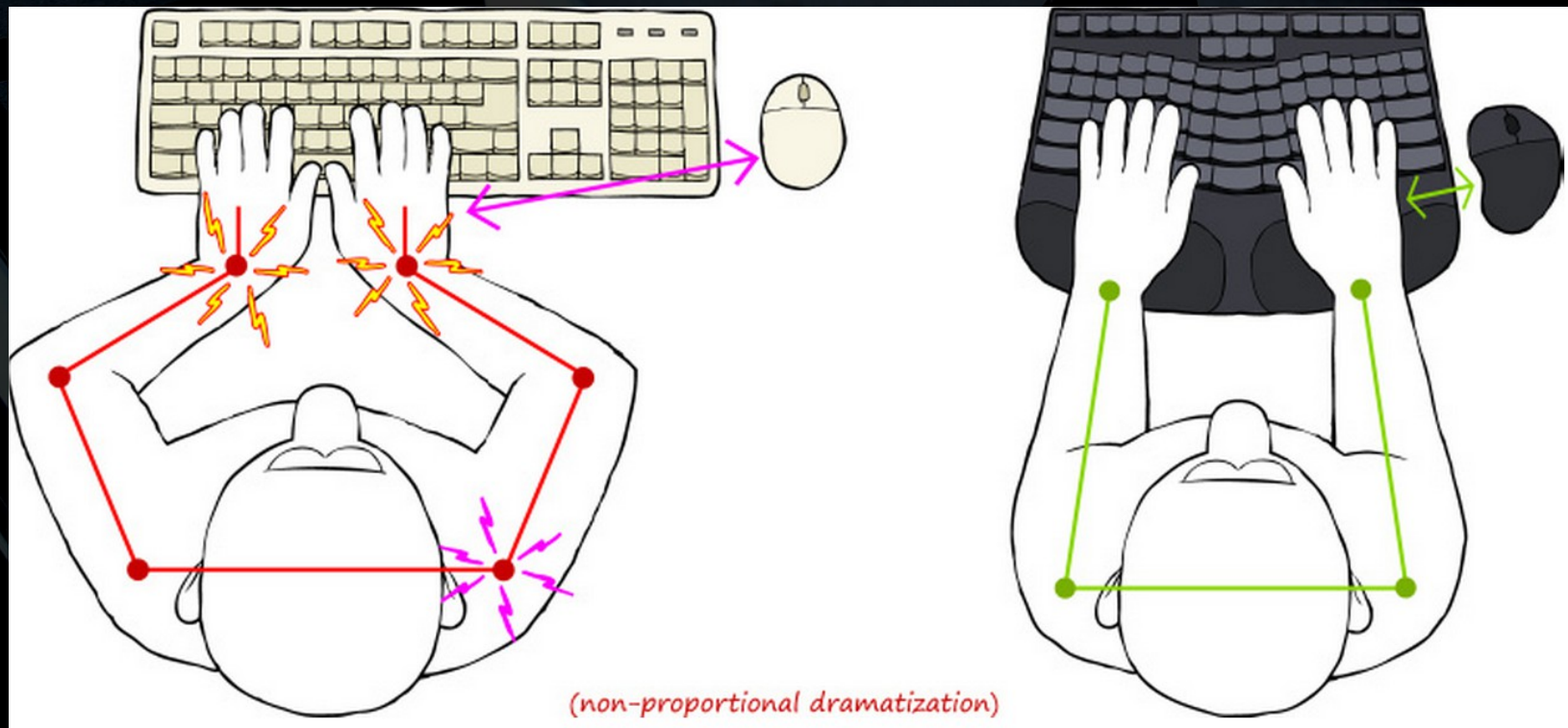
...quelques essais



Claviers / Ergodox

1 – Historique

c – Nouveautés



Claviers / Ergodox

1 – Historique

c – Nouveautés



Claviers / Ergodox

2 – Ergodox

a – Principe

Un clavier entièrement configurable :

- touches entièrement programmables
- le plus ergonomique possible
- plusieurs "couches" activables
- touches mécaniques au choix
- entièrement open source
- macros possibles
- full N-key rollover (test : deux shift + AZERTY)

Claviers / Ergodox

2 – Ergodox

b – Caractéristiques

Clavier en deux parties

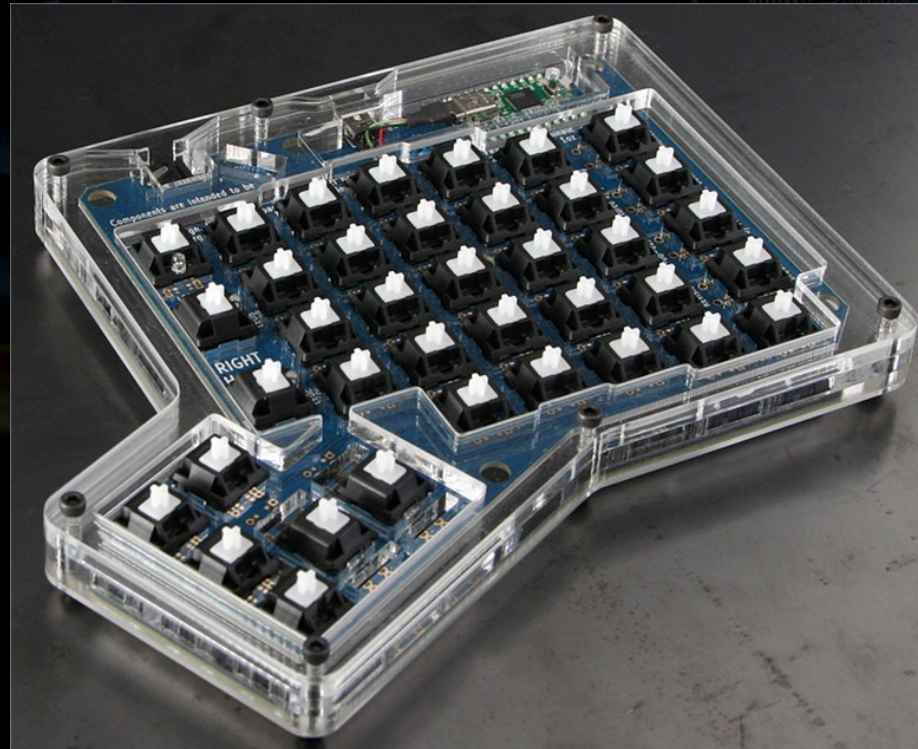


Claviers / Ergodox

2 – Ergodox

b – Caractéristiques

Touches mécaniques configurables



Claviers / Ergodox

2 – Ergodox

b – Caractéristiques

Entièrement programmable

```
26 /*
27 * Keymap: Default Layer in AZERTY / Layer0: default
28 */
29 ERGODOX_KEYMAP( // Layer 0 : (key) and (shifted key)
30 /*
31 /* | Esc | & 1 | é 2 | " 3 | ' 4 | ( 5 | ^L3 | Pscr | - 6 | à 7 | _ 8 | ç 9 | â 0 | Bspc | */
32 /* | ESC , 1 , 2 , 3 , 4 , 5 , FN3 , PSCR , 6 , 7 , 8 , 9 , BSPC , */
33 /*
34 /* | Tab | a A | z Z | e E | r R | t T | Bspc | - | y Y | u U | i I | o O | p P | ^ ~ | */
35 /* | TAB , Q , W , E , R , T , BSPC , NO , Y , U , I , O , P , LBRC , */
36 /*
37 /* | . | q Q | s S | d D | f F | g G | - - | h H | j J | k K | l L | = M | Enter | */
38 /* | PDOT , A , S , D , F , G , _ _ , H , J , K , L , SCLN , ENT , */
39 /*
40 /* | Lsft | w W | x X | c C | v V | b B | | Ins | n N | , ? | ; - | : / | ! $ | Rsfst | */
41 /* | LSFT , Z , X , C , V , B , | INS , N , M , COMM , DOT , SLASH , RSFT , */
42 /*
43 /* | Lctl | LGui | LAlt | Lsft | Del | | Spc | Spc | RAlt | RGui | Rctl | */
44 /* | LCTL , LGUI , LALT , LSFT , DEL , | SPC , SPC , RALT , RGUI , RCTL , */
45 /*
46 /*
47 /* | Copy | Pste | | Mbsp | F8 |
48 /* | FN25 , FN27 , | FN17 , F8 , |
49 /*
50 /* | | | Cut |
51 /* | | | FN26 , |
52 /*
53 /* | -L1 | -L2 | Del | | -L2 | -L1 |
54 /* | FN1 , FN2 , DEL , | FN16 , FN2 , FN1 |
55 /*
56 ) ,
57
58 ERGODOX_KEYMAP( // Layer 1
59 // left hand = chars for developer right hand = moving cursor + cut/copy/paste
60 /*
61 /* | Esc | F1 | F2 | F3 | F4 | F5 | F6 | | F7 | F8 | F9 | F10 | F11 | F12 | Bspc | */
62 /* | ESC , F1 , F2 , F3 , F4 , F5 , F6 , | F7 , F8 , F9 , F10 , F11 , F12 , BSPC , */
```

Claviers / Ergodox

2 – Ergodox

b – Caractéristiques

Entièrement programmable... en restant accessible

ErgoDox Layout Configurator ([Assembly Instructions](#))

This tool generates the Teensy board firmware .hex file for controlling the ErgoDox (see [instructions](#)).

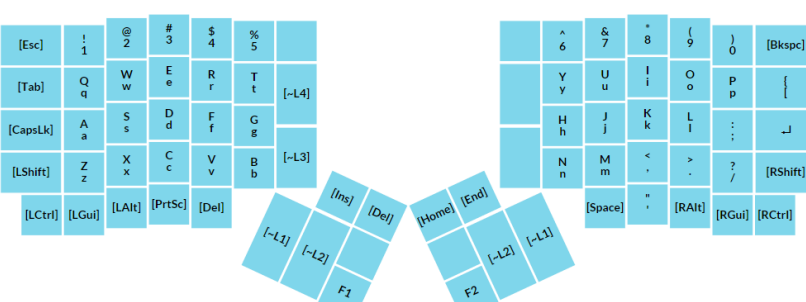
- **Left click** a key in the configurator, then press any keyboard key to assign a key to that position
- **Right click** a key in the configurator to assign keys by name
- **Download Current Layout (hex)** will compile your layout to a .hex file which you can load onto the ErgoDox
- **Share Layout** will generate a link to your layout for sharing or collaboration
- **Defaults** allow you to load preset key configurations

See **Additional Information** for more details. Special thanks to Ben Blazak's [work](#), which inspired this tool. We're very excited to see what you'll come up with. Remember to share your layouts in the discussion!

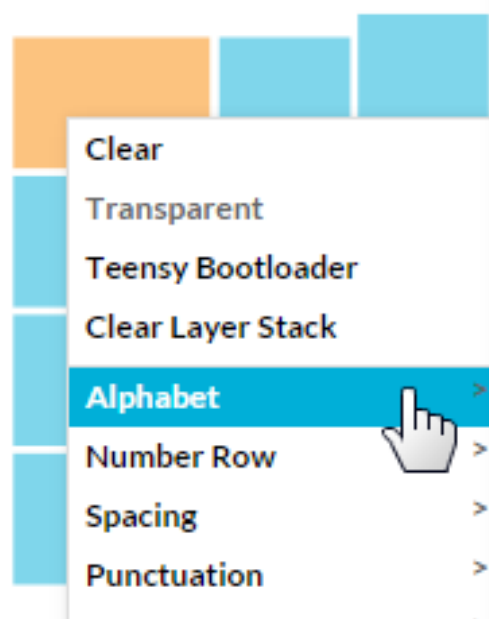
Configurator Discussion 319 Additional Information [Facebook](#) [Twitter](#) [Reddit](#) [Submit](#)

[Download Current Layout \(hex\)](#) Source Code [Share Layout](#) [Save](#) [Load](#) [Defaults](#)

Layer 0:



Layer 0:



- Clear
- Transparent
- Teensy Bootloader
- Clear Layer Stack
- Alphabet**
- Number Row
- Spacing
- Punctuation
- Function Keys (F1-F12)

- KEY_a_A
- KEY_b_B
- KEY_c_C
- KEY_d_D
- KEY_e_E
- KEY_f_F
- KEY_g_G
- KEY_h_H
- KEY_i_I
- KEY_j_J
- KEY_k_K
- KEY_l_L

Claviers / Ergodox

2 – Ergodox

c – Exemple concret

... le mien !



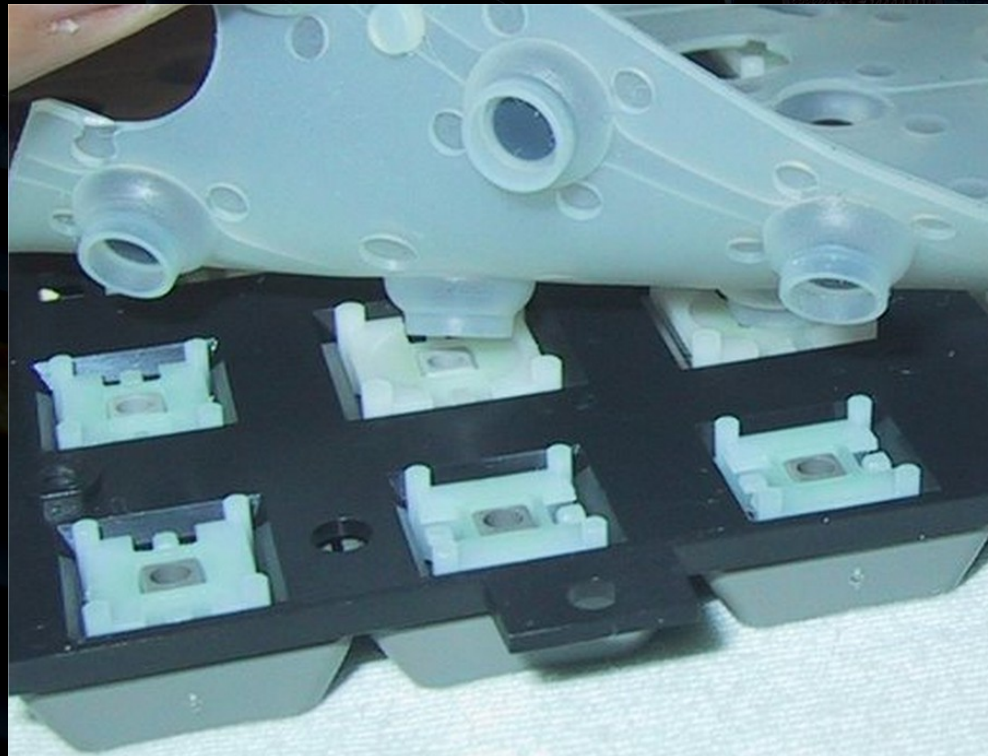
Claviers / Ergodox

3 – Touches mécaniques

a – Principe

L'opposé d'abord

Switches "dome"



Claviers / Ergodox

3 – Touches mécaniques

a – Principe

Switches mécaniques



Claviers / Ergodox

3 – Touches mécaniques

a – Principe

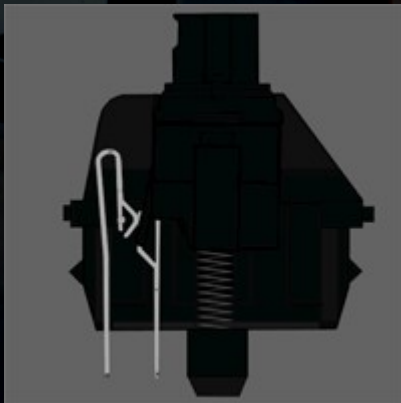
Switches linéaires

Aucun bruit de "click"

Trop sensibles

Réactifs

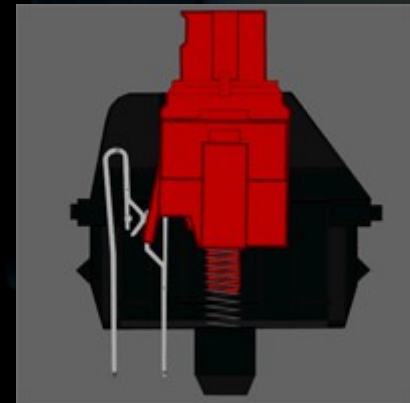
Aucun bruit



Actuation force

$\leq 60\text{cN}$

$45\text{cN} \Rightarrow$



Claviers / Ergodox

3 – Touches mécaniques

a – Principe

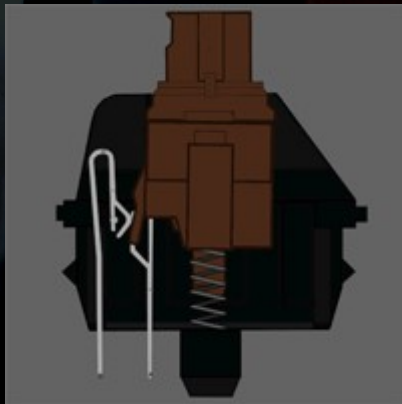
Switches tactiles

Léger bruit de "click"

Sensation du "click"

Assez sensibles

Peu de bruit



Actuation force

45cN => 55cN

Claviers / Ergodox

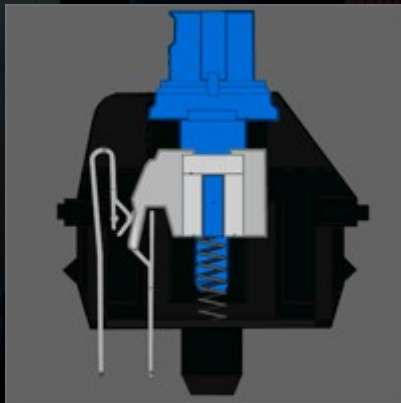
3 – Touches mécaniques

a – Principe

Switches tactiles

Bruyants

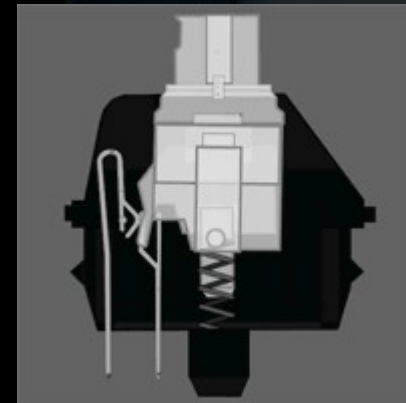
Sensation forte du "click"



Actuation force

$\leq 50 > 60 \text{cN}$

$50 > 80 \text{cN} \Rightarrow$



Claviers / Ergodox

3 – Touches mécaniques

a – Principe

Razer

Hyper sensibles

"Clicky"



Claviers / Ergodox

4 – Ma configuration

a – Hardware

Réception

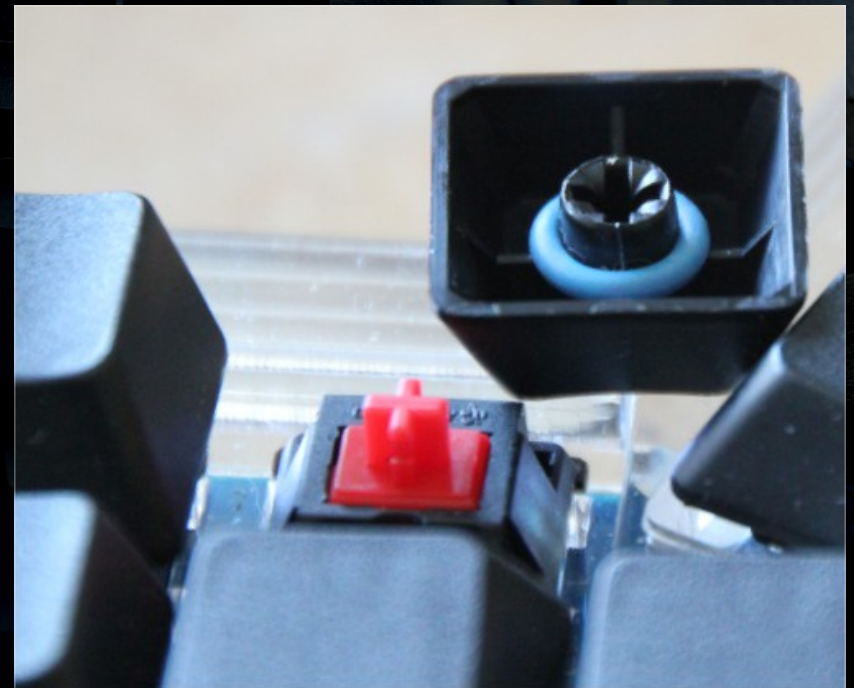


Claviers / Ergodox

4 – Ma configuration

a – Hardware

O-Rings



Claviers / Ergodox

4 – Ma configuration

a – Hardware

WASD Keyboard(.com)



Claviers / Ergodox

4 – Ma configuration

a – Hardware

WASD Keyboard(.com)



Claviers / Ergodox

4 – Ma configuration

b – Software

Teensy = microcontrôleur de l'ergodox

Teensy Loader App

Pour uploader le firmware dans le Teensy



Mac



Linux



Windows

On peut le lancer en ligne de commande !

Claviers / Ergodox

4 – Ma configuration

b – Software

Générer une image du firmware à partir des sources

https://github.com/cub-uanic/tmk_keyboard/tree/cub_layout



cub-uanic / tmk_keyboard
forked from tmk/tmk_keyboard

Générer une image du firmware à partir des sources

```
make -f Makefile.lufa azerty
```

```
teensy_loader_cli.exe -mmcuc=atmega32u4 -w "ergodox_lufa.hex"
```


Claviers / Ergodox

4 – Ma configuration

b – Software

Couche 1

Esc	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12	Bspc
Tab	\	<	_	>		\$	Cut	Copy	Ct←	↑	Ct→	Pste	^ "
-	{	(/)	}	=	Home	←	↓	→	End	Enter	
Lsft	#	[*]	@		-	PgUp	Ins	PgDn	PEnt	Rsft	
Lctl	LGui	LAlt	~	Lsft			0	.	RAlt	RGui	Rctl		

	-	-
	-	-
-	-	-

	-	-
	-	-
-	-	-

Claviers / Ergodox

4 – Ma configuration

b – Software

Couche 2

Esc	-	-	-	-	-	-	-	-	-	NLCK	/	*	-	Bspc
Tab	-	ô	â	à	-	-	-	-	-	7	8	9	+	^ "
-	ë	é	-	è	-	-	-	-	-	4	5	6	+	PEnt
Lsft	-	-	û	ù	-	-	-	-	%	1	2	3	PEnt	Rsft
Lctl	LGui	LAlt	Spc	Lsft	-	-	-	-	-	0	.	RAlt	RGui	Rctl

-	-	-
-	-	-
-	-	-

-	-	-
-	-	-
-	-	-

Claviers / Ergodox

4 – Ma configuration

b – Software

Couche 3

Esc	-	-	-	-	-	^L3	^L4	-	-	-	-	-	-
-	Bspc	z Z	Del	-	-	-	-	Bspc	↑	Del	-	-	-
-	q Q	s S	s S	-	-	-	-	←	↓	→	-	Enter	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	LAlt	-	-	-	-	-	-	-	-	-	-	-

-	-	-
-	-	-

-	-	-
-	-	-

Claviers / Ergodox

4 – Ma configuration

b – Software

<http://olivierpons.fr> => menu ergodox

ERGODOX ▾
1 – RÉCEPTION ET MONTAGE
2 – LES O-RING
3 – CONFIGURATION AZERTY ET CONVERSION
4 – COMMENT FAIRE DES MACROS
5 – LE SILENCE
6 – MA CONFIGURATION DU CLAVIER
7 – WASD KEYBOARD CUSTOMISATION
8 – ERGODOX – SOURCE CLAVIER AZERTY

3 – ERGODOX : CONFIGURATION AZERTY ET CONVERSION

A a	Q q	F1	F1	[App]		[Xor]	
B b	B b	F2	F2	[Pow]		^	
C c	C c	F3	F3	[Exec]		%	
D d	D d	F4	F4	[Help]		<	
E e	E e	F5	F5	[Menu]		>	