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| Bochs User Manual | | |
| [Prev](http://docs.google.com/bochsrc.html) | Chapter 4. Setup | [Next](http://docs.google.com/using-bochs.html) |

4.4. How to write your own keymap table

Christophe Bothamy wrote the keymapping code for Bochs, and provided this documentation for how to create new keymaps. Keymapping was first implemented for X windows only, so there are many references to X-specific values in this section. In Bochs 2.0 keymapping is also available for SDL (Linux port) and wxWidgets (wxGTK port).

The standard US Keyboard looks like this:  
  
 -------------------------------------------  
 Top row Esc F1 F2 F3 F4 F5 F6 F7 F8 F9 F10 F11 F12  
 -------------------------------------------  
 2nd row ` 1 2 3 4 5 6 7 8 9 0 - = \ Back  
 -------------------------------------------  
 3rd row Tab Q W E R T Y U I O P [ ] Enter  
 -------------------------------------------  
 4rd row Caps A S D F G H J K L ; '  
 -------------------------------------------  
 5rd row lShift l\ Z X C V B N M , . / rShift  
 -------------------------------------------  
 6rd row lCtrl lAlt Space rAlt rCtrl  
 -------------------------------------------

Each key of the US keyboard maps to a Bochs constant named BX\_KEY\_*symbol*. You can find the current list of BX\_KEY\_*symbol* in [the BX\_KEY table](http://docs.google.com/keymap.html#BX-KEY-TABLE), below. Please note that there is only one BX\_KEY\_*symbol* for each physical key.

Now, for each key of the US keyboard, look at which symbols you can type on your real keyboard. Each symbol maps to a X-windows XK\_*symbol* constant. In X11/keysymdef.h, you will find the list of all possible XK\_*symbol* on your system. Alternatively, you can use a small utility called "xev" that prints out the symbol names of a pressed key. Note that the symbol name given by xev does not contain the XK\_ prefix. Don't forget to add a line for every symbol you can type on each key. For the key BX\_KEY\_A, you can type both lowercase 'a' and uppercase 'A', so you would need two different entries.

You can then create your own map file. Keymap files are found in the "gui/keymaps" directory in the source code, or in the "keymaps" directory in binary releases. Look at the existing keymap file as an example, and create a file containing one line for each symbol. The first column tells what key or combination of keys can be used to produce a given symbol. The second column is the ASCII equivalent for that symbol, or a special keyword (none, space, return, tab, backslash, or apostrophe). The third column is the X windows keysym for that symbol.

For example :

BX\_KEY\_0 '0' XK\_0  
BX\_KEY\_1 '1' XK\_1  
BX\_KEY\_2 '2' XK\_2  
BX\_KEY\_0+BX\_KEY\_SHIFT\_L ')' XK\_parenright  
BX\_KEY\_1+BX\_KEY\_SHIFT\_L '!' XK\_exclam  
BX\_KEY\_2+BX\_KEY\_SHIFT\_L '@' XK\_at  
BX\_KEY\_A 'a' XK\_a  
BX\_KEY\_B 'b' XK\_b  
BX\_KEY\_A+BX\_KEY\_SHIFT\_L 'A' XK\_A  
BX\_KEY\_B+BX\_KEY\_SHIFT\_L 'B' XK\_B  
BX\_KEY\_TAB tab XK\_Tab  
BX\_KEY\_ENTER return XK\_Return  
BX\_KEY\_F1 none XK\_F1  
BX\_KEY\_F2 none XK\_F2  
BX\_KEY\_F3 none XK\_F3

Now that there are several keymap files in the Bochs distribution, it is easiest to copy an existing keymap and follow the examples you see. When it works, be sure to send it to the mailing list or post it on Source Forge so that we can include it in the next release. You may need to look up some of your country specific X11 symbols in X11/keysymdef.h.

**Table 4-6. BX\_KEY constants**

|  |  |
| --- | --- |
| BX\_KEY constant | Keyboard Symbol |
| BX\_KEY\_CTRL\_L | left Ctrl |
| BX\_KEY\_SHIFT\_L | left Shift |
| BX\_KEY\_F1 | F1 |
| BX\_KEY\_F2 | F2 |
| BX\_KEY\_F3 | F3 |
| BX\_KEY\_F4 | F4 |
| BX\_KEY\_F5 | F5 |
| BX\_KEY\_F6 | F6 |
| BX\_KEY\_F7 | F7 |
| BX\_KEY\_F8 | F8 |
| BX\_KEY\_F9 | F9 |
| BX\_KEY\_F10 | F10 |
| BX\_KEY\_F11 | F11 |
| BX\_KEY\_F12 | F12 |
| BX\_KEY\_CTRL\_R | right Ctrl |
| BX\_KEY\_SHIFT\_R | right Shift |
| BX\_KEY\_CAPS\_LOCK | CapsLock |
| BX\_KEY\_NUM\_LOCK | NumLock |
| BX\_KEY\_ALT\_L | left Alt |
| BX\_KEY\_ALT\_R | right Alt |
| BX\_KEY\_A | A |
| BX\_KEY\_B | B |
| BX\_KEY\_C | C |
| BX\_KEY\_D | D |
| BX\_KEY\_E | E |
| BX\_KEY\_F | F |
| BX\_KEY\_G | G |
| BX\_KEY\_H | H |
| BX\_KEY\_I | I |
| BX\_KEY\_J | J |
| BX\_KEY\_K | K |
| BX\_KEY\_L | L |
| BX\_KEY\_M | M |
| BX\_KEY\_N | N |
| BX\_KEY\_O | O |
| BX\_KEY\_P | P |
| BX\_KEY\_Q | Q |
| BX\_KEY\_R | R |
| BX\_KEY\_S | S |
| BX\_KEY\_T | T |
| BX\_KEY\_U | U |
| BX\_KEY\_V | V |
| BX\_KEY\_W | W |
| BX\_KEY\_X | X |
| BX\_KEY\_Y | Y |
| BX\_KEY\_Z | Z |
| BX\_KEY\_0 | 0 |
| BX\_KEY\_1 | 1 |
| BX\_KEY\_2 | 2 |
| BX\_KEY\_3 | 3 |
| BX\_KEY\_4 | 4 |
| BX\_KEY\_5 | 5 |
| BX\_KEY\_6 | 6 |
| BX\_KEY\_7 | 7 |
| BX\_KEY\_8 | 8 |
| BX\_KEY\_9 | 9 |
| BX\_KEY\_ESC | Esc |
| BX\_KEY\_SPACE | SpaceBar |
| BX\_KEY\_SINGLE\_QUOTE | ' |
| BX\_KEY\_COMMA | , |
| BX\_KEY\_PERIOD | . |
| BX\_KEY\_SLASH | / |
| BX\_KEY\_SEMICOLON | ; |
| BX\_KEY\_EQUALS | = |
| BX\_KEY\_LEFT\_BRACKET | [ |
| BX\_KEY\_BACKSLASH | \ |
| BX\_KEY\_RIGHT\_BRACKET | ] |
| BX\_KEY\_MINUS | - |
| BX\_KEY\_GRAVE | ` |
| BX\_KEY\_BACKSPACE | BackSpace |
| BX\_KEY\_ENTER | Enter |
| BX\_KEY\_TAB | Tab |
| BX\_KEY\_LEFT\_BACKSLASH | left \ |
| BX\_KEY\_PRINT | PrintScreen |
| BX\_KEY\_SCRL\_LOCK | ScrollLock |
| BX\_KEY\_PAUSE | Pause |
| BX\_KEY\_INSERT | Ins |
| BX\_KEY\_DELETE | Del |
| BX\_KEY\_HOME | Home |
| BX\_KEY\_END | End |
| BX\_KEY\_PAGE\_UP | PageUo |
| BX\_KEY\_PAGE\_DOWN | PageDown |
| BX\_KEY\_KP\_ADD | Numeric Keypad + |
| BX\_KEY\_KP\_SUBTRACT | Numeric Keypad - |
| BX\_KEY\_KP\_END | Numeric Keypad 1 |
| BX\_KEY\_KP\_DOWN | Numeric Keypad 2 |
| BX\_KEY\_KP\_PAGE\_DOWN | Numeric Keypad 3 |
| BX\_KEY\_KP\_LEFT | Numeric Keypad 4 |
| BX\_KEY\_KP\_5 | Numeric Keypad 5 |
| BX\_KEY\_KP\_RIGHT | Numeric Keypad 6 |
| BX\_KEY\_KP\_HOME | Numeric Keypad 7 |
| BX\_KEY\_KP\_UP | Numeric Keypad 8 |
| BX\_KEY\_KP\_PAGE\_UP | Numeric Keypad 9 |
| BX\_KEY\_KP\_INSERT | Numeric Keypad 0 |
| BX\_KEY\_KP\_DELETE | Numeric Keypad . |
| BX\_KEY\_KP\_ENTER | Numeric Keypad Enter |
| BX\_KEY\_KP\_MULTIPLY | Numeric Keypad \* |
| BX\_KEY\_KP\_DIVIDE | Numeric Keypad / |
| BX\_KEY\_UP | UpArrow |
| BX\_KEY\_DOWN | DownArrow |
| BX\_KEY\_LEFT | LeftArrow |
| BX\_KEY\_RIGHT | RightArrow |
| BX\_KEY\_WIN\_L | Left Windows |
| BX\_KEY\_WIN\_R | Right Windows |
| BX\_KEY\_MENU | Menu |
| BX\_KEY\_ALT\_SYSREQ | Alt-Sysreq |
| BX\_KEY\_CTRL\_BREAK | Ctrl-Break |
| BX\_KEY\_INT\_BACK | Internet - back |
| BX\_KEY\_INT\_FORWARD | Internet - forward |
| BX\_KEY\_INT\_STOP | Internet - stop |
| BX\_KEY\_INT\_MAIL | Internet - mail |
| BX\_KEY\_INT\_SEARCH | Internet - search |
| BX\_KEY\_INT\_FAV | Internet - favorites |
| BX\_KEY\_INT\_HOME | Internet - home |
| BX\_KEY\_POWER\_MYCOMP | Powerkeys - my computer |
| BX\_KEY\_POWER\_CALC | Powerkeys - calculator |
| BX\_KEY\_POWER\_SLEEP | Powerkeys - sleep |
| BX\_KEY\_POWER\_POWER | Powerkeys - power |
| BX\_KEY\_POWER\_WAKE | Powerkeys - wake |

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| [Prev](http://docs.google.com/bochsrc.html) | [Home](http://docs.google.com/index.html) | [Next](http://docs.google.com/using-bochs.html) |
| The configuration file bochsrc | [Up](http://docs.google.com/setup.html) | Using Bochs |