

**NAME**

XChangeKeyboardControl, XGetKeyboardControl, XAutoRepeatOn, XAutoRepeatOff, XBell, XQueryKeymap, XKeyboardControl – manipulate keyboard settings and keyboard control structure

**SYNTAX**

```
int XChangeKeyboardControl(Display *display, unsigned long value_mask, XKeyboardControl *values);
int XGetKeyboardControl(Display *display, XKeyboardState *values_return);
int XAutoRepeatOn(Display *display);
int XAutoRepeatOff(Display *display);
int XBell(Display *display, int percent);
int XQueryKeymap(Display *display, char keys_return[32]);
```

**ARGUMENTS**

<i>display</i>	Specifies the connection to the X server.
<i>keys_return</i>	Returns an array of bytes that identifies which keys are pressed down. Each bit represents one key of the keyboard.
<i>percent</i>	Specifies the volume for the bell, which can range from -100 to 100 inclusive.
<i>value_mask</i>	Specifies which controls to change. This mask is the bitwise inclusive OR of the valid control mask bits.
<i>values</i>	Specifies one value for each bit set to 1 in the mask.
<i>values_return</i>	Returns the current keyboard controls in the specified <b>XKeyboardState</b> structure.

**DESCRIPTION**

The **XChangeKeyboardControl** function controls the keyboard characteristics defined by the **XKeyboardControl** structure. The *value\_mask* argument specifies which values are to be changed.

**XChangeKeyboardControl** can generate **BadMatch** and **BadValue** errors.

The **XGetKeyboardControl** function returns the current control values for the keyboard to the **XKeyboardState** structure.

The **XAutoRepeatOn** function turns on auto-repeat for the keyboard on the specified display.

The **XAutoRepeatOff** function turns off auto-repeat for the keyboard on the specified display.

The **XBell** function rings the bell on the keyboard on the specified display, if possible. The specified volume is relative to the base volume for the keyboard. If the value for the *percent* argument is not in the range -100 to 100 inclusive, a **BadValue** error results. The volume at which the bell rings when the *percent* argument is nonnegative is:

$$\text{base} - [(\text{base} * \text{percent}) / 100] + \text{percent}$$

The volume at which the bell rings when the *percent* argument is negative is:

$$\text{base} + [(\text{base} * \text{percent}) / 100]$$

To change the base volume of the bell, use **XChangeKeyboardControl**.

**XBell** can generate a **BadValue** error.

The **XQueryKeymap** function returns a bit vector for the logical state of the keyboard, where each bit set to 1 indicates that the corresponding key is currently pressed down. The vector is represented as 32 bytes. Byte *N* (from 0) contains the bits for keys 8*N* to 8*N* + 7 with the least significant bit in the byte representing key 8*N*.

Note that the logical state of a device (as seen by client applications) may lag the physical state if device event processing is frozen.

**STRUCTURES**

The **XKeyboardControl** structure contains:

```

/* Mask bits for ChangeKeyboardControl */
#define    KBKeyClickPercent          (1L<<0)
#define    KBBellPercent              (1L<<1)
#define    KBBellPitch                (1L<<2)
#define    KBBellDuration            (1L<<3)
#define    KBLed                      (1L<<4)
#define    KBLedMode                  (1L<<5)
#define    KBKey                      (1L<<6)
#define    KBAutoRepeatMode          (1L<<7)
/* Values */

typedef struct {
    int key_click_percent;
    int bell_percent;
    int bell_pitch;
    int bell_duration;
    int led;
    int led_mode;    /* LedModeOn, LedModeOff */
    int key;
    int auto_repeat_mode; /* AutoRepeatModeOff, AutoRepeatModeOn,
                          AutoRepeatModeDefault */
} XKeyboardControl;

```

The `key_click_percent` member sets the volume for key clicks between 0 (off) and 100 (loud) inclusive, if possible. A setting of `-1` restores the default. Other negative values generate a **BadValue** error.

The `bell_percent` sets the base volume for the bell between 0 (off) and 100 (loud) inclusive, if possible. A setting of `-1` restores the default. Other negative values generate a **BadValue** error. The `bell_pitch` member sets the pitch (specified in Hz) of the bell, if possible. A setting of `-1` restores the default. Other negative values generate a **BadValue** error. The `bell_duration` member sets the duration of the bell specified in milliseconds, if possible. A setting of `-1` restores the default. Other negative values generate a **BadValue** error.

If both the `led_mode` and `led` members are specified, the state of that LED is changed, if possible. The `led_mode` member can be set to **LedModeOn** or **LedModeOff**. If only `led_mode` is specified, the state of all LEDs are changed, if possible. At most 32 LEDs numbered from one are supported. No standard interpretation of LEDs is defined. If `led` is specified without `led_mode`, a **BadMatch** error results.

If both the `auto_repeat_mode` and `key` members are specified, the `auto_repeat_mode` of that key is changed (according to **AutoRepeatModeOn**, **AutoRepeatModeOff**, or **AutoRepeatModeDefault**), if possible. If only `auto_repeat_mode` is specified, the global `auto_repeat_mode` for the entire keyboard is changed, if possible, and does not affect the per-key settings. If a key is specified without an `auto_repeat_mode`, a **BadMatch** error results. Each key has an individual mode of whether or not it should auto-repeat and a default setting for the mode. In addition, there is a global mode of whether auto-repeat should be enabled or not and a default setting for that mode. When global mode is **AutoRepeatModeOn**, keys should obey their individual auto-repeat modes. When global mode is **AutoRepeatModeOff**, no keys should auto-repeat. An auto-repeating key generates alternating **KeyPress** and **KeyRelease** events. When a key is used as a modifier, it is desirable for the key not to auto-repeat, regardless of its auto-repeat setting.

The **XKeyboardState** structure contains:

```

typedef struct {
    int key_click_percent;
    int bell_percent;
    unsigned int bell_pitch, bell_duration;
    unsigned long led_mask;
}

```

```
    int global_auto_repeat;
    char auto_repeats[32];
} XKeyboardState;
```

For the LEDs, the least significant bit of `led_mask` corresponds to LED one, and each bit set to 1 in `led_mask` indicates an LED that is lit. The `global_auto_repeat` member can be set to **AutoRepeatModeOn** or **AutoRepeatModeOff**. The `auto_repeats` member is a bit vector. Each bit set to 1 indicates that auto-repeat is enabled for the corresponding key. The vector is represented as 32 bytes. Byte `N` (from 0) contains the bits for keys `8N` to `8N + 7` with the least significant bit in the byte representing key `8N`.

## DIAGNOSTICS

**BadMatch** Some argument or pair of arguments has the correct type and range but fails to match in some other way required by the request.

**BadValue** Some numeric value falls outside the range of values accepted by the request. Unless a specific range is specified for an argument, the full range defined by the argument's type is accepted. Any argument defined as a set of alternatives can generate this error.

## SEE ALSO

`XChangeKeyboardMapping(3)`, `XkbChangeEnabledControls(3)`, `XkbBell(3)`, `XkbDeviceBell(3)`, `XkbGetMap(3)`, `XSetPointerMapping(3)`

*Xlib – C Language X Interface*