



man pages section 3: Curses Library Functions

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Contents

Preface 11

Curses Library Functions 17

addch(3XCURSES) 18
addchstr(3XCURSES) 20
addnstr(3XCURSES) 22
addnwstr(3XCURSES) 24
add_wch(3XCURSES) 26
add_wchnstr(3XCURSES) 28
attr_get(3XCURSES) 30
attroff(3XCURSES) 32
baudrate(3XCURSES) 34
beep(3XCURSES) 35
bkgd(3XCURSES) 36
bkgrnd(3XCURSES) 38
border(3XCURSES) 40
border_set(3XCURSES) 42
can_change_color(3XCURSES) 44
cbreak(3XCURSES) 47
chgat(3XCURSES) 48
clear(3XCURSES) 50
clearok(3XCURSES) 51
clrtoebot(3XCURSES) 53
clrtoeol(3XCURSES) 54
COLS(3XCURSES) 55
copywin(3XCURSES) 56

<code>curs_addch(3CURSES)</code>	58
<code>curs_addchstr(3CURSES)</code>	61
<code>curs_addstr(3CURSES)</code>	62
<code>curs_addwch(3CURSES)</code>	63
<code>curs_addwchstr(3CURSES)</code>	66
<code>curs_addwstr(3CURSES)</code>	68
<code>curs_alecompat(3CURSES)</code>	69
<code>curs_attr(3CURSES)</code>	70
<code>curs_beep(3CURSES)</code>	72
<code>curs_bkgd(3CURSES)</code>	73
<code>curs_border(3CURSES)</code>	74
<code>curs_clear(3CURSES)</code>	76
<code>curs_color(3CURSES)</code>	77
<code>curscr(3XCURSES)</code>	80
<code>curs_delch(3CURSES)</code>	81
<code>curs_deleteln(3CURSES)</code>	82
<code>curses(3CURSES)</code>	83
<code>curses(3XCURSES)</code>	98
<code>curs_getch(3CURSES)</code>	109
<code>curs_getstr(3CURSES)</code>	114
<code>curs_getwch(3CURSES)</code>	115
<code>curs_getwstr(3CURSES)</code>	120
<code>curs_getyx(3CURSES)</code>	121
<code>curs_inch(3CURSES)</code>	122
<code>curs_inchstr(3CURSES)</code>	123
<code>curs_initscr(3CURSES)</code>	124
<code>curs_inopts(3CURSES)</code>	126
<code>curs_insch(3CURSES)</code>	129
<code>curs_insstr(3CURSES)</code>	130
<code>curs_instr(3CURSES)</code>	132
<code>curs_inswch(3CURSES)</code>	133
<code>curs_inswstr(3CURSES)</code>	134
<code>curs_inwch(3CURSES)</code>	136
<code>curs_inwchstr(3CURSES)</code>	137
<code>curs_inwstr(3CURSES)</code>	138
<code>curs_kernel(3CURSES)</code>	139
<code>curs_move(3CURSES)</code>	141
<code>curs_outopts(3CURSES)</code>	142

curs_overlay(3CURSES) 145
curs_pad(3CURSES) 146
curs_printw(3CURSES) 148
curs_refresh(3CURSES) 149
curs_scanw(3CURSES) 151
curs_scr_dump(3CURSES) 152
curs_scroll(3CURSES) 154
curs_set(3XCURSES) 155
curs_slk(3CURSES) 156
curs_termattrs(3CURSES) 158
curs_termcap(3CURSES) 160
curs_terminfo(3CURSES) 162
curs_touch(3CURSES) 166
curs_util(3CURSES) 168
curs_window(3CURSES) 170
cur_term(3XCURSES) 173
def_prog_mode(3XCURSES) 174
delay_output(3XCURSES) 175
delch(3XCURSES) 176
del_curterm(3XCURSES) 177
deleteln(3XCURSES) 179
delscreen(3XCURSES) 180
delwin(3XCURSES) 181
derwin(3XCURSES) 182
doupdate(3XCURSES) 184
dupwin(3XCURSES) 185
echo(3XCURSES) 186
echochar(3XCURSES) 187
echo_wchar(3XCURSES) 188
endwin(3XCURSES) 189
erasechar(3XCURSES) 190
filter(3XCURSES) 191
flushinp(3XCURSES) 192
form_cursor(3CURSES) 193
form_data(3CURSES) 194
form_driver(3CURSES) 195
form_field(3CURSES) 198
form_field_attributes(3CURSES) 199

form_field_buffer(3CURSES) 200
form_field_info(3CURSES) 201
form_field_just(3CURSES) 202
form_field_new(3CURSES) 203
form_field_opts(3CURSES) 204
form_fieldtype(3CURSES) 206
form_field_userptr(3CURSES) 208
form_field_validation(3CURSES) 209
form_hook(3CURSES) 210
form_new(3CURSES) 212
form_new_page(3CURSES) 213
form_opts(3CURSES) 214
form_page(3CURSES) 215
form_post(3CURSES) 217
forms(3CURSES) 218
form_userptr(3CURSES) 222
form_win(3CURSES) 223
getbegyx(3XCURSES) 224
getcchar(3XCURSES) 225
getch(3XCURSES) 226
getnstr(3XCURSES) 231
getn_wstr(3XCURSES) 233
get_wch(3XCURSES) 235
getwin(3XCURSES) 237
halfdelay(3XCURSES) 238
has_ic(3XCURSES) 239
hline(3XCURSES) 240
hline_set(3XCURSES) 242
idcok(3XCURSES) 244
immedok(3XCURSES) 245
inch(3XCURSES) 246
inchnstr(3XCURSES) 247
initscr(3XCURSES) 249
innstr(3XCURSES) 251
innwstr(3XCURSES) 253
insch(3XCURSES) 255
insdelln(3XCURSES) 256
insertln(3XCURSES) 257

insnstr(3XCURSES) 258
ins_nwstr(3XCURSES) 260
ins_wch(3XCURSES) 262
intrflush(3XCURSES) 264
in_wch(3XCURSES) 265
in_wchnstr(3XCURSES) 266
is_linetouched(3XCURSES) 268
keyname(3XCURSES) 270
keypad(3XCURSES) 272
libcurses(3XCURSES) 276
LINES(3XCURSES) 284
longname(3XCURSES) 285
menu_attributes(3CURSES) 286
menu_cursor(3CURSES) 288
menu_driver(3CURSES) 289
menu_format(3CURSES) 291
menu_hook(3CURSES) 292
menu_item_current(3CURSES) 294
menu_item_name(3CURSES) 296
menu_item_new(3CURSES) 297
menu_item_opts(3CURSES) 298
menu_items(3CURSES) 299
menu_item_userptr(3CURSES) 300
menu_item_value(3CURSES) 301
menu_item_visible(3CURSES) 302
menu_mark(3CURSES) 303
menu_new(3CURSES) 304
menu_opts(3CURSES) 305
menu_pattern(3CURSES) 307
menu_post(3CURSES) 308
menus(3CURSES) 309
menu_userptr(3CURSES) 313
menu_win(3CURSES) 314
meta(3XCURSES) 315
move(3XCURSES) 316
mvcur(3XCURSES) 317
mvderwin(3XCURSES) 318
mvprintw(3XCURSES) 319

mvscanw(3XCURSES) 320
mvwin(3XCURSES) 321
napms(3XCURSES) 322
newpad(3XCURSES) 323
nl(3XCURSES) 325
nodelay(3XCURSES) 326
noqiflush(3XCURSES) 327
notimeout(3XCURSES) 328
overlay(3XCURSES) 330
panel_above(3XCURSES) 334
panel_move(3XCURSES) 335
panel_new(3XCURSES) 336
panels(3XCURSES) 337
panel_show(3XCURSES) 339
panel_top(3XCURSES) 340
panel_update(3XCURSES) 341
panel_userptr(3XCURSES) 342
panel_window(3XCURSES) 343
pechochar(3XCURSES) 344
plot(3PLOT) 345
putp(3XCURSES) 348
redrawwin(3XCURSES) 350
resetty(3XCURSES) 351
ripoffline(3XCURSES) 352
scr_dump(3XCURSES) 353
sclr(3XCURSES) 354
setcchar(3XCURSES) 355
set_term(3XCURSES) 356
slk_attroff(3XCURSES) 357
standend(3XCURSES) 360
stdscr(3XCURSES) 361
syncok(3XCURSES) 362
termattrs(3XCURSES) 363
termname(3XCURSES) 364
tgetent(3XCURSES) 365
tigetflag(3XCURSES) 367
typeahead(3XCURSES) 369
unctrl(3XCURSES) 370

ungetch(3XCURSES) 371
use_env(3XCURSES) 372
vidattr(3XCURSES) 373
vw_printw(3XCURSES) 375
vwprintw(3XCURSES) 376
vw_scanw(3XCURSES) 377
vwscanw(3XCURSES) 378
wunctrl(3XCURSES) 379

Index 381

Preface

Both novice users and those familiar with the SunOS operating system can use online man pages to obtain information about the system and its features. A man page is intended to answer concisely the question “What does it do?” The man pages in general comprise a reference manual. They are not intended to be a tutorial.

Overview

The following contains a brief description of each man page section and the information it references:

- Section 1 describes, in alphabetical order, commands available with the operating system.
- Section 1M describes, in alphabetical order, commands that are used chiefly for system maintenance and administration purposes.
- Section 2 describes all of the system calls. Most of these calls have one or more error returns. An error condition is indicated by an otherwise impossible returned value.
- Section 3 describes functions found in various libraries, other than those functions that directly invoke UNIX system primitives, which are described in Section 2.
- Section 4 outlines the formats of various files. The C structure declarations for the file formats are given where applicable.
- Section 5 contains miscellaneous documentation such as character-set tables.
- Section 6 contains available games and demos.
- Section 7 describes various special files that refer to specific hardware peripherals and device drivers. STREAMS software drivers, modules and the STREAMS-generic set of system calls are also described.

- Section 9 provides reference information needed to write device drivers in the kernel environment. It describes two device driver interface specifications: the Device Driver Interface (DDI) and the Driver/Kernel Interface (DKI).
- Section 9E describes the DDI/DKI, DDI-only, and DKI-only entry-point routines a developer can include in a device driver.
- Section 9F describes the kernel functions available for use by device drivers.
- Section 9S describes the data structures used by drivers to share information between the driver and the kernel.

Below is a generic format for man pages. The man pages of each manual section generally follow this order, but include only needed headings. For example, if there are no bugs to report, there is no BUGS section. See the `intro` pages for more information and detail about each section, and `man(1)` for more information about man pages in general.

NAME	This section gives the names of the commands or functions documented, followed by a brief description of what they do.								
SYNOPSIS	<p>This section shows the syntax of commands or functions. When a command or file does not exist in the standard path, its full path name is shown. Options and arguments are alphabetized, with single letter arguments first, and options with arguments next, unless a different argument order is required.</p> <p>The following special characters are used in this section:</p> <table border="0" style="margin-left: 20px;"> <tr> <td style="padding-right: 10px;">[]</td> <td>Brackets. The option or argument enclosed in these brackets is optional. If the brackets are omitted, the argument must be specified.</td> </tr> <tr> <td style="padding-right: 10px;">. . .</td> <td>Ellipses. Several values can be provided for the previous argument, or the previous argument can be specified multiple times, for example, "filename . . .".</td> </tr> <tr> <td style="padding-right: 10px;"> </td> <td>Separator. Only one of the arguments separated by this character can be specified at a time.</td> </tr> <tr> <td style="padding-right: 10px;">{ }</td> <td>Braces. The options and/or arguments enclosed within braces are interdependent, such that everything enclosed must be treated as a unit.</td> </tr> </table>	[]	Brackets. The option or argument enclosed in these brackets is optional. If the brackets are omitted, the argument must be specified.	. . .	Ellipses. Several values can be provided for the previous argument, or the previous argument can be specified multiple times, for example, "filename . . .".		Separator. Only one of the arguments separated by this character can be specified at a time.	{ }	Braces. The options and/or arguments enclosed within braces are interdependent, such that everything enclosed must be treated as a unit.
[]	Brackets. The option or argument enclosed in these brackets is optional. If the brackets are omitted, the argument must be specified.								
. . .	Ellipses. Several values can be provided for the previous argument, or the previous argument can be specified multiple times, for example, "filename . . .".								
	Separator. Only one of the arguments separated by this character can be specified at a time.								
{ }	Braces. The options and/or arguments enclosed within braces are interdependent, such that everything enclosed must be treated as a unit.								

PROTOCOL	This section occurs only in subsection 3R to indicate the protocol description file.
DESCRIPTION	This section defines the functionality and behavior of the service. Thus it describes concisely what the command does. It does not discuss OPTIONS or cite EXAMPLES. Interactive commands, subcommands, requests, macros, and functions are described under USAGE.
IOCTL	This section appears on pages in Section 7 only. Only the device class that supplies appropriate parameters to the <code>ioctl(2)</code> system call is called <code>ioctl</code> and generates its own heading. <code>ioctl</code> calls for a specific device are listed alphabetically (on the man page for that specific device). <code>ioctl</code> calls are used for a particular class of devices all of which have an <code>io</code> ending, such as <code>mtio(7I)</code> .
OPTIONS	This section lists the command options with a concise summary of what each option does. The options are listed literally and in the order they appear in the SYNOPSIS section. Possible arguments to options are discussed under the option, and where appropriate, default values are supplied.
OPERANDS	This section lists the command operands and describes how they affect the actions of the command.
OUTPUT	This section describes the output – standard output, standard error, or output files – generated by the command.
RETURN VALUES	If the man page documents functions that return values, this section lists these values and describes the conditions under which they are returned. If a function can return only constant values, such as 0 or -1, these values are listed in tagged paragraphs. Otherwise, a single paragraph describes the return values of each function. Functions declared void do not return values, so they are not discussed in RETURN VALUES.
ERRORS	On failure, most functions place an error code in the global variable <code>errno</code> indicating why they failed. This section lists alphabetically all error codes a function can generate and describes the conditions that cause each error. When more than

	one condition can cause the same error, each condition is described in a separate paragraph under the error code.
USAGE	This section lists special rules, features, and commands that require in-depth explanations. The subsections listed here are used to explain built-in functionality: Commands Modifiers Variables Expressions Input Grammar
EXAMPLES	This section provides examples of usage or of how to use a command or function. Wherever possible a complete example including command-line entry and machine response is shown. Whenever an example is given, the prompt is shown as <code>example%</code> , or if the user must be superuser, <code>example#</code> . Examples are followed by explanations, variable substitution rules, or returned values. Most examples illustrate concepts from the SYNOPSIS, DESCRIPTION, OPTIONS, and USAGE sections.
ENVIRONMENT VARIABLES	This section lists any environment variables that the command or function affects, followed by a brief description of the effect.
EXIT STATUS	This section lists the values the command returns to the calling program or shell and the conditions that cause these values to be returned. Usually, zero is returned for successful completion, and values other than zero for various error conditions.
FILES	This section lists all file names referred to by the man page, files of interest, and files created or required by commands. Each is followed by a descriptive summary or explanation.
ATTRIBUTES	This section lists characteristics of commands, utilities, and device drivers by defining the attribute type and its corresponding value. See <code>attributes(5)</code> for more information.
SEE ALSO	This section lists references to other man pages, in-house documentation, and outside publications.

DIAGNOSTICS	This section lists diagnostic messages with a brief explanation of the condition causing the error.
WARNINGS	This section lists warnings about special conditions which could seriously affect your working conditions. This is not a list of diagnostics.
NOTES	This section lists additional information that does not belong anywhere else on the page. It takes the form of an aside to the user, covering points of special interest. Critical information is never covered here.
BUGS	This section describes known bugs and, wherever possible, suggests workarounds.

Curses Library Functions

addch(3XCURSES)

NAME	addch, mvaddch, mvwaddch, waddch – add a character (with rendition) to a window										
SYNOPSIS	<pre>cc [flag...] file... -I /usr/xpg4/include -L /usr/xpg4/lib \ -R /usr/xpg4/lib -lcurses [library...] c89 [flag...] file... -lcurses [library ...] #include <curses.h> int addch(const chtype ch); int mvaddch(int y, int x, const chtype ch); int mvwaddch(WINDOW *win, int y, int x, const chtype ch); int waddch(WINDOW *win, const chtype ch);</pre>										
DESCRIPTION	<p>The <code>addch()</code> function writes a character to the <code>stdscr</code> window at the current cursor position. The <code>mvaddch()</code> and <code>mvwaddch()</code> functions write the character to the position indicated by the <code>x</code> (column) and <code>y</code> (row) parameters. The <code>mvaddch()</code> function writes the character to the <code>stdscr</code> window, while <code>mvwaddch()</code> writes the character to the window specified by <code>win</code>. The <code>waddch()</code> function is identical to <code>addch()</code>, but writes the character to the window specified by <code>win</code>.</p> <p>These functions advance the cursor after writing the character. Characters that do not fit on the end of the current line are wrapped to the beginning of the next line unless the current line is the last line of the window and scrolling is disabled. In that situation, characters which extend beyond the end of the line are discarded.</p> <p>When <code>ch</code> is a backspace, carriage return, newline, or tab, X/Open Curses moves the cursor appropriately. Each tab character moves the cursor to the next tab stop. By default, tab stops occur every eight columns. When <code>ch</code> is a control character other than backspace, carriage return, newline, or tab, it is written using <code>^x</code> notation, where <code>x</code> is a printable character. When X/Open Curses writes <code>ch</code> to the last character position on a line, it automatically generates a newline. When <code>ch</code> is written to the last character position of a scrolling region and <code>scrollok()</code> is enabled, X/Open Curses scrolls the scrolling region up one line (see <code>clearok(3XCURSES)</code>).</p>										
PARAMETERS	<table><tr><td><i>wchstr</i></td><td>Is a pointer to the <code>cchar_t</code> string to be copied to the window.</td></tr><tr><td><i>n</i></td><td>Is the maximum number of characters to be copied from <i>wchstr</i>. If <i>n</i> is less than 0, the entire string is written or as much of it as fits on the line.</td></tr><tr><td><i>y</i></td><td>Is the <code>y</code> (row) coordinate of the starting position of <i>wchstr</i> in the window.</td></tr><tr><td><i>x</i></td><td>Is the <code>x</code> (column) coordinate of the starting position of <i>wchstr</i> in the window.</td></tr><tr><td><i>win</i></td><td>Is a pointer to the window to which the string is to be copied.</td></tr></table>	<i>wchstr</i>	Is a pointer to the <code>cchar_t</code> string to be copied to the window.	<i>n</i>	Is the maximum number of characters to be copied from <i>wchstr</i> . If <i>n</i> is less than 0, the entire string is written or as much of it as fits on the line.	<i>y</i>	Is the <code>y</code> (row) coordinate of the starting position of <i>wchstr</i> in the window.	<i>x</i>	Is the <code>x</code> (column) coordinate of the starting position of <i>wchstr</i> in the window.	<i>win</i>	Is a pointer to the window to which the string is to be copied.
<i>wchstr</i>	Is a pointer to the <code>cchar_t</code> string to be copied to the window.										
<i>n</i>	Is the maximum number of characters to be copied from <i>wchstr</i> . If <i>n</i> is less than 0, the entire string is written or as much of it as fits on the line.										
<i>y</i>	Is the <code>y</code> (row) coordinate of the starting position of <i>wchstr</i> in the window.										
<i>x</i>	Is the <code>x</code> (column) coordinate of the starting position of <i>wchstr</i> in the window.										
<i>win</i>	Is a pointer to the window to which the string is to be copied.										
RETURN VALUES	On success, these functions return OK. Otherwise, they return ERR.										

addch(3XCURSES)

ERRORS None.

ATTRIBUTES See `attributes(5)` for descriptions of the following attributes:

ATTRIBUTE TYPE	ATTRIBUTE VALUE
Interface Stability	Standard
MT-Level	Unsafe

SEE ALSO `attroff(3XCURSES)`, `bkgdset(3XCURSES)`, `douupdate(3XCURSES)`, `inch(3XCURSES)`, `insch(3XCURSES)`, `libcurses(3XCURSES)`, `nl(3XCURSES)`, `printw(3XCURSES)`, `scrollok(3XCURSES)`, `scl(3XCURSES)`, `terminfo(4)`, `attributes(5)`, `standards(5)`

addchstr(3XCURSES)

NAME	addchstr, addchnstr, mvaddchstr, mvaddchnstr, mvwaddchnstr, mvwaddchstr, waddchstr, waddchnstr – copy a character string (with renditions) to a window										
SYNOPSIS	<pre>cc [flag...] file... -I /usr/xpg4/include -L /usr/xpg4/lib \ -R /usr/xpg4/lib -lcurses [library...] c89 [flag...] file... -lcurses [library ...] #include <curses.h> int addchstr(const chtype *chstr); int addchnstr(const chtype *chstr, int n); int mvaddchnstr(int y, int x, const chtype *chstr, int n); int mvaddchstr(int y, int x, const chtype *chstr); int mvwaddchnstr(WINDOW *win, int y, int x, const chtype *chstr, int n); int mvwaddchstr(WINDOW *win, int y, int x, const chtype *chstr); int waddchstr(WINDOW *win, const chtype *chstr); int waddchnstr(WINDOW *win, const chtype *chstr, int n);</pre>										
DESCRIPTION	<p>The <code>addchstr()</code> function copies the <code>chtype</code> character string to the <code>stdscr</code> window at the current cursor position. The <code>mvaddchstr()</code> and <code>mvwaddchstr()</code> functions copy the character string to the starting position indicated by the <code>x</code> (column) and <code>y</code> (row) parameters (the former to the <code>stdscr</code> window; the latter to window <code>win</code>). The <code>waddchstr()</code> is identical to <code>addchstr()</code>, but writes to the window specified by <code>win</code>.</p> <p>The <code>addchnstr()</code>, <code>waddchnstr()</code>, <code>mvaddchnstr()</code>, and <code>mvwaddchnstr()</code> functions write <code>n</code> characters to the window, or as many as will fit on the line. If <code>n</code> is less than 0, the entire string is written, or as much of it as fits on the line. The former two functions place the string at the current cursor position; the latter two commands use the position specified by the <code>x</code> and <code>y</code> parameters.</p> <p>These functions differ from the <code>addstr(3XCURSES)</code> set of functions in two important respects. First, these functions do <i>not</i> advance the cursor after writing the string to the window. Second, the current window rendition is not combined with the character; only the attributes that are already part of the <code>chtype</code> character are used.</p>										
PARAMETERS	<table><tr><td><code>chstr</code></td><td>Is a pointer to the <code>chtype</code> string to be copied to the window.</td></tr><tr><td><code>n</code></td><td>Is the maximum number of characters to be copied from <code>chstr</code>. If <code>n</code> is less than 0, the entire string is written or as much of it as fits on the line.</td></tr><tr><td><code>y</code></td><td>Is the <code>y</code> (row) coordinate of the starting position of <code>chstr</code> in the window.</td></tr><tr><td><code>x</code></td><td>Is the <code>x</code> (column) coordinate of the starting position of <code>chstr</code> in the window.</td></tr><tr><td><code>win</code></td><td>Is a pointer to the window to which the string is to be copied.</td></tr></table>	<code>chstr</code>	Is a pointer to the <code>chtype</code> string to be copied to the window.	<code>n</code>	Is the maximum number of characters to be copied from <code>chstr</code> . If <code>n</code> is less than 0, the entire string is written or as much of it as fits on the line.	<code>y</code>	Is the <code>y</code> (row) coordinate of the starting position of <code>chstr</code> in the window.	<code>x</code>	Is the <code>x</code> (column) coordinate of the starting position of <code>chstr</code> in the window.	<code>win</code>	Is a pointer to the window to which the string is to be copied.
<code>chstr</code>	Is a pointer to the <code>chtype</code> string to be copied to the window.										
<code>n</code>	Is the maximum number of characters to be copied from <code>chstr</code> . If <code>n</code> is less than 0, the entire string is written or as much of it as fits on the line.										
<code>y</code>	Is the <code>y</code> (row) coordinate of the starting position of <code>chstr</code> in the window.										
<code>x</code>	Is the <code>x</code> (column) coordinate of the starting position of <code>chstr</code> in the window.										
<code>win</code>	Is a pointer to the window to which the string is to be copied.										
RETURN VALUES	On success, these functions return OK. Otherwise, they return ERR.										

addchstr(3XCURSES)

ERRORS None.

ATTRIBUTES See `attributes(5)` for descriptions of the following attributes:

ATTRIBUTE TYPE	ATTRIBUTE VALUE
Interface Stability	Standard
MT-Level	Unsafe

SEE ALSO `addch(3XCURSES)`, `addnstr(3XCURSES)`, `attroff(3XCURSES)`,
`libcurses(3XCURSES)`, `attributes(5)`, `standards(5)`

addnstr(3XCURSES)

NAME	addnstr, addstr, mvaddnstr, mvaddstr, mvwaddnstr, mvwaddstr, waddnstr, waddstr – add a multi-byte character string (without rendition) to a window						
SYNOPSIS	<pre>cc [flag...] file... -I /usr/xpg4/include -L /usr/xpg4/lib \ -R /usr/xpg4/lib -lcurses [library...] c89 [flag...] file... -lcurses [library ...] #include <curses.h> int addnstr(const char *str, int n); int addstr(const char *str); int mvaddnstr(int y, int x, const char *str, int n); int mvaddstr(int y, int x, const char *str); int mvwaddnstr(WINDOW *win, int y, int x, const char *str, int n); int mvwaddstr(WINDOW *win, int y, int x, const char *str); int waddstr(WINDOW *win, const char *str); int waddnstr(WINDOW *win, const char *str, int n);</pre>						
DESCRIPTION	<p>The <code>addstr()</code> function writes a null-terminated string of multi-byte characters to the <code>stdscr</code> window at the current cursor position. The <code>waddstr()</code> function performs an identical action, but writes the character to the window specified by <i>win</i>. The <code>mvaddstr()</code> and <code>mvwaddstr()</code> functions write the string to the position indicated by the <i>x</i> (column) and <i>y</i> (row) parameters (the former to the <code>stdscr</code> window; the latter to window <i>win</i>).</p> <p>The <code>addnstr()</code>, <code>waddnstr()</code>, <code>mvaddnstr()</code>, and <code>mvwaddnstr()</code> functions are similar but write at most <i>n</i> characters to the window. If <i>n</i> is less than 0, the entire string is written.</p> <p>All of these functions advance the cursor after writing the string.</p> <p>These functions are functionally equivalent to calling the corresponding function from the <code>addch(3XCURSES)</code> set of functions once for each character in the string. Refer to the <code>curses(3XCURSES)</code> man page for a complete description of special character handling and of the interaction between the window rendition (or background character and rendition) and the character written.</p> <p>Note that these functions differ from the <code>addchstr()</code> set of functions in that the <code>addchstr(3XCURSES)</code> functions copy the string as is (without combining each character with the window rendition or the background character and rendition).</p>						
PARAMETERS	<table><tr><td><i>str</i></td><td>Is a pointer to the character string that is to be written to the window.</td></tr><tr><td><i>n</i></td><td>Is the maximum number of characters to be copied from <i>str</i>. If <i>n</i> is less than 0, the entire string is written or as much of it as fits on the line.</td></tr><tr><td><i>y</i></td><td>Is the <i>y</i> (row) coordinate of the starting position of <i>str</i> in the window.</td></tr></table>	<i>str</i>	Is a pointer to the character string that is to be written to the window.	<i>n</i>	Is the maximum number of characters to be copied from <i>str</i> . If <i>n</i> is less than 0, the entire string is written or as much of it as fits on the line.	<i>y</i>	Is the <i>y</i> (row) coordinate of the starting position of <i>str</i> in the window.
<i>str</i>	Is a pointer to the character string that is to be written to the window.						
<i>n</i>	Is the maximum number of characters to be copied from <i>str</i> . If <i>n</i> is less than 0, the entire string is written or as much of it as fits on the line.						
<i>y</i>	Is the <i>y</i> (row) coordinate of the starting position of <i>str</i> in the window.						

addnstr(3XCURSES)

x Is the *x* (column) coordinate of the starting position of *str* in the window.

win Is a pointer to the window in which the string is to be written.

RETURN VALUES On success, these functions return OK. Otherwise, they return ERR.

ERRORS None.

ATTRIBUTES See `attributes(5)` for descriptions of the following attributes:

ATTRIBUTE TYPE	ATTRIBUTE VALUE
Interface Stability	Standard
MT-Level	Unsafe

SEE ALSO `addch(3XCURSES)`, `addchstr(3XCURSES)`, `curses(3XCURSES)`, `libcurses(3XCURSES)`, `attributes(5)`, `standards(5)`

addnwstr(3XCURSES)

NAME	addnwstr, addwstr, mvaddnwstr, mvaddwstr, mvwaddnwstr, mvwaddwstr, waddnwstr, waddwstr – add a wide-character string to a window
SYNOPSIS	<pre>cc [flag...] file... -I /usr/xpg4/include -L /usr/xpg4/lib \ -R /usr/xpg4/lib -lcurses [library...] c89 [flag...] file... -lcurses [library ...] #include <curses.h> int addnwstr(const wchar_t *wstr, int n); int addwstr(const wchar_t *wstr); int mvaddnwstr(int y, int x, const wchar_t *wstr, int n); int mvaddwstr(int y, int x, const wchar_t *wstr); int mvwaddnwstr(WINDOW*win, int y, int x, const wchar_t *wstr, int n); int mvwaddwstr(WINDOW*win, int y, int x, const wchar_t *wstr); int waddnwstr(WINDOW*win, const wchar_t *wstr, int n); int waddwstr(WINDOW*win, const wchar_t *wstr);</pre>
DESCRIPTION	<p>The <code>addwstr()</code> function writes a null-terminated wide-character string to the <code>stdscr</code> window at the current cursor position. The <code>waddwstr()</code> function performs an identical action, but writes the string to the window specified by <code>win</code>. The <code>mvaddwstr()</code> and <code>mvwaddwstr()</code> functions write the string to the position indicated by the <code>x</code> (column) and <code>y</code> (row) parameters (the former to the <code>stdscr</code> window; the latter to window <code>win</code>).</p> <p>The <code>addnwstr()</code>, <code>waddnwstr()</code>, <code>mvaddnwstr()</code>, and <code>mvwaddnwstr()</code> functions write at most <code>n</code> characters to the window. If <code>n</code> is less than 0, the entire string is written. The former two functions place the characters at the current cursor position; the latter two commands use the position specified by the <code>x</code> and <code>y</code> parameters.</p> <p>All of these functions advance the cursor after writing the string.</p> <p>These functions are functionally equivalent to building a <code>cchar_t</code> from the <code>wchar_t</code> and the window rendition (or background character and rendition) and calling the <code>wadd_wch(3XCURSES)</code> function once for each <code>wchar_t</code> in the string. Refer to the <code>curses(3XCURSES)</code> man page for a complete description of special character handling and of the interaction between the window rendition (or background character and rendition) and the character written.</p> <p>Note that these functions differ from the <code>add_wchnstr(3XCURSES)</code> set of functions in that the latter copy the string as is (without combining each character with the foreground and background attributes of the window).</p>
PARAMETERS	<p><code>wstr</code> Is a pointer to the wide-character string that is to be written to the window.</p>

addnwstr(3XCURSES)

n Is the maximum number of characters to be copied from *wstr*. If *n* is less than 0, the entire string is written or as much of it as fits on the line.

y Is the y (row) coordinate of the starting position of *wstr* in the window.

x Is the x (column) coordinate of the starting position of *wstr* in the window.

win Is a pointer to the window in which the string is to be written.

RETURN VALUES On success, these functions return OK. Otherwise, they return ERR.

ERRORS None.

ATTRIBUTES See `attributes(5)` for descriptions of the following attributes:

ATTRIBUTE TYPE	ATTRIBUTE VALUE
Interface Stability	Standard
MT-Level	Unsafe

SEE ALSO `add_wch(3XCURSES)`, `add_wchnstr(3XCURSES)`, `curses(3XCURSES)`, `libcurses(3XCURSES)`, `attributes(5)`, `standards(5)`

add_wch(3XCURSES)

NAME	add_wch, mvadd_wch, mvwadd_wch, wadd_wch – add a complex character (with rendition) to a window						
SYNOPSIS	<pre>cc [flag...] file... -I /usr/xpg4/include -L /usr/xpg4/lib \ -R /usr/xpg4/lib -lcurses [library...] c89 [flag...] file... -lcurses [library ...] #include <curses.h> int add_wch(const cchar_t *wch); int wadd_wch(WINDOW *win, const cchar_t *wch); int mvadd_wch(int y, int x, const cchar_t *wch); int mvwadd_wch(WINDOW *win, int y, int x, const cchar_t *wch);</pre>						
DESCRIPTION	<p>The <code>add_wch()</code> function writes a complex character to the <code>stdscr</code> window at the current cursor position. The <code>mvadd_wch()</code> and <code>mvwadd_wch()</code> functions write the character to the position indicated by the <i>x</i> (column) and <i>y</i> (row) parameters. The <code>mvadd_wch()</code> function writes the character to the <code>stdscr</code> window, while <code>mvwadd_wch()</code> writes the character to the window specified by <i>win</i>. The <code>wadd_wch()</code> function is identical to <code>add_wch()</code>, but writes the character to the window specified by <i>win</i>. These functions advance the cursor after writing the character.</p> <p>If <i>wch</i> is a spacing complex character, X/Open Curses replaces any previous character at the specified location with <i>wch</i> (and its rendition). If <i>wch</i> is a non-spacing complex character, X/Open Curses preserves all existing characters at the specified location and adds the non-spacing characters of <i>wch</i> to the spacing complex character. It ignores the rendition associated with <i>wch</i>.</p> <p>Characters that do not fit on the end of the current line are wrapped to the beginning of the next line unless the current line is the last line of the window and scrolling is disabled. In that situation, X/Open Curses discards characters which extend beyond the end of the line.</p> <p>When <i>wch</i> is a backspace, carriage return, newline, or tab, X/Open Curses moves the cursor appropriately as described in the <code>curses(3XCURSES)</code> man page. Each tab character moves the cursor to the next tab stop. By default, tab stops occur every eight columns. When <i>wch</i> is a control character other than a backspace, carriage return, newline, or tab, it is written using <code>^x</code> notation, where <i>x</i> is a printable character. When X/Open Curses writes <i>wch</i> to the last character position on a line, it automatically generates a newline. When <i>wch</i> is written to the last character position of a scrolling region and <code>scrollok()</code> is enabled, X/Open Curses scrolls the scrolling region up one line (see <code>clearok(3XCURSES)</code>).</p>						
PARAMETERS	<table><tr><td><i>wch</i></td><td>Is the character/attribute pair (rendition) to be written to the window.</td></tr><tr><td><i>win</i></td><td>Is a pointer to the window in which the character is to be written.</td></tr><tr><td><i>y</i></td><td>Is the <i>y</i> (row) coordinate of the character's position in the window.</td></tr></table>	<i>wch</i>	Is the character/attribute pair (rendition) to be written to the window.	<i>win</i>	Is a pointer to the window in which the character is to be written.	<i>y</i>	Is the <i>y</i> (row) coordinate of the character's position in the window.
<i>wch</i>	Is the character/attribute pair (rendition) to be written to the window.						
<i>win</i>	Is a pointer to the window in which the character is to be written.						
<i>y</i>	Is the <i>y</i> (row) coordinate of the character's position in the window.						

add_wch(3XCURSES)

x Is the *x* (column) coordinate of the character's position in the window.

RETURN VALUES On success, these functions return OK. Otherwise, they return ERR.

ERRORS None.

ATTRIBUTES See `attributes(5)` for descriptions of the following attributes:

ATTRIBUTE TYPE	ATTRIBUTE VALUE
Interface Stability	Standard
MT-Level	Unsafe

SEE ALSO `attr_off(3XCURSES)`, `bkgrndset(3XCURSES)`, `curses(3XCURSES)`, `doupdate(3XCURSES)`, `in_wch(3XCURSES)`, `ins_wch(3XCURSES)`, `libcurses(3XCURSES)`, `nl(3XCURSES)`, `printw(3XCURSES)`, `scrollok(3XCURSES)`, `sclr(3XCURSES)`, `setscrreg(3XCURSES)`, `terminfo(4)`, `attributes(5)`, `standards(5)`

add_wchnstr(3XCURSES)

NAME	add_wchnstr, add_wchstr, mvadd_wchnstr, mvadd_wchstr, mvwadd_wchnstr, mvwadd_wchstr, wadd_wchnstr, wadd_wchstr – copy a string of complex characters (with renditions) to a window						
SYNOPSIS	<pre>cc [flag...] file... -I /usr/xpg4/include -L /usr/xpg4/lib \ -R /usr/xpg4/lib -lcurses [library...] c89 [flag...] file... -lcurses [library ...] #include <curses.h> int add_wchnstr(const cchar_t *wchstr, int n); int add_wchstr(const cchar_t *wchstr); int mvadd_wchnstr(int y, int x, const cchar_t *wchstr, int n); int mvadd_wchstr(int y, int x, const cchar_t *wchstr); int mvwadd_wchnstr(WINDOW *win, int y, int x, const cchar_t *wchstr, int n); int mvwadd_wchstr(WINDOW *win, int y, int x, const cchar_t *wchstr); int wadd_wchstr(WINDOW *win, const cchar_t *wchstr); int wadd_wchnstr(WINDOW *win, const cchar_t *wchstr, int n);</pre>						
DESCRIPTION	<p>The <code>add_wchstr()</code> function copies the string of <code>cchar_t</code> characters to the <code>stdscr</code> window at the current cursor position. The <code>mvadd_wchstr()</code> and <code>mvwadd_wchstr()</code> functions copy the string to the starting position indicated by the <code>x</code> (column) and <code>y</code> (row) parameters (the former to the <code>stdscr</code> window; the latter to window <code>win</code>). The <code>wadd_wchstr()</code> is identical to <code>add_wchstr()</code>, but writes to the window specified by <code>win</code>.</p> <p>The <code>add_wchnstr()</code>, <code>wadd_wchnstr()</code>, <code>mvadd_wchnstr()</code>, and <code>mvwadd_wchnstr()</code> functions write <code>n</code> characters to the window, or as many as will fit on the line. If <code>n</code> is less than 0, the entire string is written, or as much of it as fits on the line. The former two functions place the string at the current cursor position; the latter two commands use the position specified by the <code>x</code> and <code>y</code> parameters.</p> <p>These functions differ from the <code>addwstr(3XCURSES)</code> set of functions in two important respects. First, these functions do <i>not</i> advance the cursor after writing the string to the window. Second, the current window rendition (that is, the combination of attributes and color pair) is not combined with the character; only those attributes that are already part of the <code>cchar_t</code> character are used.</p>						
PARAMETERS	<table><tr><td><code>wchstr</code></td><td>Is a pointer to the <code>cchar_t</code> string to be copied to the window.</td></tr><tr><td><code>n</code></td><td>Is the maximum number of characters to be copied from <code>wchstr</code>. If <code>n</code> is less than 0, the entire string is written or as much of it as fits on the line.</td></tr><tr><td><code>y</code></td><td>Is the <code>y</code> (row) coordinate of the starting position of <code>wchstr</code> in the window.</td></tr></table>	<code>wchstr</code>	Is a pointer to the <code>cchar_t</code> string to be copied to the window.	<code>n</code>	Is the maximum number of characters to be copied from <code>wchstr</code> . If <code>n</code> is less than 0, the entire string is written or as much of it as fits on the line.	<code>y</code>	Is the <code>y</code> (row) coordinate of the starting position of <code>wchstr</code> in the window.
<code>wchstr</code>	Is a pointer to the <code>cchar_t</code> string to be copied to the window.						
<code>n</code>	Is the maximum number of characters to be copied from <code>wchstr</code> . If <code>n</code> is less than 0, the entire string is written or as much of it as fits on the line.						
<code>y</code>	Is the <code>y</code> (row) coordinate of the starting position of <code>wchstr</code> in the window.						

add_wchnstr(3XCURSES)

x Is the *x* (column) coordinate of the starting position of *wchstr* in the window.

win Is a pointer to the window to which the string is to be copied.

RETURN VALUES On success, these functions return OK. Otherwise, they return ERR.

ERRORS None.

ATTRIBUTES See `attributes(5)` for descriptions of the following attributes:

ATTRIBUTE TYPE	ATTRIBUTE VALUE
Interface Stability	Standard
MT-Level	Unsafe

SEE ALSO `addnwstr(3XCURSES)`, `add_wch(3XCURSES)`, `attr_off(3XCURSES)`, `libcurses(3XCURSES)`, `attributes(5)`, `standards(5)`

attr_get(3XCURSES)

NAME	attr_get, attr_off, attr_on, attr_set, color_set, wattr_get, wattr_off, wattr_on, wattr_set, wcolor_set – control window attributes								
SYNOPSIS	<pre>cc [flag...] file... -I /usr/xpg4/include -L /usr/xpg4/lib \ -R /usr/xpg4/lib -lcurses [library...] c89 [flag...] file... -lcurses [library...] #include <curses.h> int attr_get(attr_t *attrs, short *color, void *opts); int attr_off(attr_t attrs, void *opts); int attr_on(attr_t attrs, void *opts); int attr_set(attr_t attrs, short color, void *opts); int color_set(short *color, void *opts); int wattr_get(WINDOW *win, attr_t attrs, short *color, void *opts); int wattr_off(WINDOW *win, attr_t attrs, void *opts); int wattr_on(WINDOW *win, attr_t attrs, void *opts); int wattr_set(WINDOW *win, attr_t attrs, short color, void *opts); int wcolor_set(WINDOW *win, short color, void *opts);</pre>								
DESCRIPTION	<p>The attr_get() function retrieves the current rendition of <i>stdscr</i>. The wattr_get() function retrieves the current rendition of window <i>win</i>. If <i>attrs</i> or <i>color</i> is a null pointer, no information is retrieved.</p> <p>The attr_off() and attr_on() functions unset and set, respectively, the specified window attributes of <i>stdscr</i>. These functions only affect the attributes specified; attributes that existed before the call are retained.</p> <p>The wattr_off() and wattr_on() functions unset or set the specified attributes for window <i>win</i>.</p> <p>The attr_set() and wattr_set() functions change the rendition of <i>stdscr</i> and <i>win</i>; the old values are not retained.</p> <p>The color_set() and wcolor_set() functions set the window color of <i>stdscr</i> and <i>win</i> to <i>color</i>.</p> <p>The attributes and color pairs that can be used are specified in the Attributes, Color Pairs, and Renditions section of the curses(3XCURSES) man page.</p>								
PARAMETERS	<table><tr><td><i>attrs</i></td><td>Is a pointer to the foreground window attributes to be set or unset.</td></tr><tr><td><i>color</i></td><td>Is a pointer to a color pair number .</td></tr><tr><td><i>opts</i></td><td>Is reserved for future use.</td></tr><tr><td><i>win</i></td><td>Is a pointer to the window in which attribute changes are to be made.</td></tr></table>	<i>attrs</i>	Is a pointer to the foreground window attributes to be set or unset.	<i>color</i>	Is a pointer to a color pair number .	<i>opts</i>	Is reserved for future use.	<i>win</i>	Is a pointer to the window in which attribute changes are to be made.
<i>attrs</i>	Is a pointer to the foreground window attributes to be set or unset.								
<i>color</i>	Is a pointer to a color pair number .								
<i>opts</i>	Is reserved for future use.								
<i>win</i>	Is a pointer to the window in which attribute changes are to be made.								

attr_get(3XCURSES)

RETURN VALUES These functions always return OK.

ERRORS None.

ATTRIBUTES See attributes(5) for descriptions of the following attributes:

ATTRIBUTE TYPE	ATTRIBUTE VALUE
Interface Stability	Standard
MT-Level	Unsafe

SEE ALSO add_wch(3XCURSES), addnwstr(3XCURSES), attroff(3XCURSES), bkgndset(3XCURSES), curses(3XCURSES), init_color(3XCURSES), libcurses(3XCURSES), start_color(3XCURSES), attributes(5), standards(5)

attroff(3XCURSES)

NAME	attroff, attron, attrset, wattroff, wattron, wattrset – change foreground window attributes
SYNOPSIS	<pre>cc [flag...] file... -I /usr/xpg4/include -L /usr/xpg4/lib \ -R /usr/xpg4/lib -lcurses [library...] c89 [flag...] file... -lcurses [library...] #include <curses.h> int attroff(int attrs); int attron(int attrs); int attrset(int attrs); int wattroff(WINDOW *win, int attrs); int wattron(WINDOW *win, int attrs); int wattrset(WINDOW *win, int attrs);</pre>
DESCRIPTION	<p>The <code>attroff()</code> and <code>attron()</code> functions unset and set, respectively, the specified window attributes of <code>stdscr</code>. These functions only affect the attributes specified; attributes that existed before the call are retained. The <code>wattroff()</code> and <code>wattron()</code> functions unset or set the specified attributes for window <i>win</i>.</p> <p>The <code>attrset()</code> and <code>wattrset()</code> functions change the specified window renditions of <code>stdscr</code> and <i>win</i> to new values; the old values are not retained.</p> <p>The attributes that can be used are specified in the <i>Attributes, Color Pairs, and Renditions</i> section of the <code>curses(3XCURSES)</code> man page.</p> <p>Here is an example that prints some text using the current window rendition, adds underlining, changes the attributes, prints more text, then changes the attributes back.</p> <pre>printw("This word is"); attron(A_UNDERLINE); printw("underlined."); attroff(A_NORMAL); printw("This is back to normal text.\n"); refresh();</pre>
PARAMETERS	<p><i>attrs</i> are the foreground window attributes to be set or unset.</p> <p><i>win</i> Is a pointer to the window in which attribute changes are to be made.</p>
RETURN VALUES	These functions always return OK or 1.
ERRORS	None.
USAGE	All of these functions may be macros.

attroff(3XCURSES)

ATTRIBUTES See `attributes(5)` for descriptions of the following attributes:

ATTRIBUTE TYPE	ATTRIBUTE VALUE
Interface Stability	Standard
MT-Level	Unsafe

SEE ALSO `addch(3XCURSES)`, `addnstr(3XCURSES)`, `attr_get(3XCURSES)`, `bkgdset(3XCURSES)`, `curses(3XCURSES)`, `init_color(3XCURSES)`, `libcurses(3XCURSES)`, `start_color(3XCURSES)`, `attributes(5)`, `standards(5)`

baudrate(3XCURSES)

NAME	baudrate – return terminal baud rate						
SYNOPSIS	<pre>cc [flag...] file... -I /usr/xpg4/include -L /usr/xpg4/lib \ -R /usr/xpg4/lib -lcurses [library...] c89 [flag...] file... -lcurses [library...] #include <curses.h> int baudrate(void);</pre>						
DESCRIPTION	The baudrate() function returns the terminal's data communication line and output speed in bits per second (for example, 9600).						
RETURN VALUES	The baudrate() function returns the output speed of the terminal.						
ERRORS	None.						
ATTRIBUTES	See attributes(5) for descriptions of the following attributes:						
	<table border="1"><thead><tr><th>ATTRIBUTE TYPE</th><th>ATTRIBUTE VALUE</th></tr></thead><tbody><tr><td>Interface Stability</td><td>Standard</td></tr><tr><td>MT-Level</td><td>Unsafe</td></tr></tbody></table>	ATTRIBUTE TYPE	ATTRIBUTE VALUE	Interface Stability	Standard	MT-Level	Unsafe
ATTRIBUTE TYPE	ATTRIBUTE VALUE						
Interface Stability	Standard						
MT-Level	Unsafe						
SEE ALSO	libcurses(3XCURSES), attributes(5), standards(5)						

NAME beep, flash – activate audio-visual alarm

SYNOPSIS `cc [flag...] file... -I /usr/xpg4/include -L /usr/xpg4/lib \`
`-R /usr/xpg4/lib -lcurses [library...]`

`c89 [flag...] file... -lcurses [library...]`

```
#include <curses.h>
int beep(void);
int flash(void);
```

DESCRIPTION The `beep()` and `flash()` functions produce an audio and visual alarm on the terminal, respectively. If the terminal has the capability, `beep()` sounds a bell or beep and `flash()` flashes the screen. One alarm is substituted for another if the terminal does not support the capability called (see `terminfo(4)` `bel` and `flash` capabilities). For example, a call to `beep()` for a terminal without that capability results in a flash.

RETURN VALUES These functions always return OK.

ERRORS None.

ATTRIBUTES See `attributes(5)` for descriptions of the following attributes:

ATTRIBUTE TYPE	ATTRIBUTE VALUE
Interface Stability	Standard
MT-Level	Unsafe

SEE ALSO `libcurses(3XCURSES)`, `terminfo(4)`, `attributes(5)`, `standards(5)`

bkgd(3XCURSES)

NAME	<code>bkgd</code> , <code>bkgdset</code> , <code>getbkgd</code> , <code>wbkgd</code> , <code>wbkgdset</code> – set or get the background character (and rendition) of window
SYNOPSIS	<pre>cc [flag...] file... -I /usr/xpg4/include -L /usr/xpg4/lib \ -R /usr/xpg4/lib -lcurses [library...] c89 [flag...] file... -lcurses [library...] #include <curses.h> int bkgd(chtype <i>ch</i>); void bkgdset(chtype <i>ch</i>); chtype getbkgd(WINDOW *<i>win</i>); int wbkgd(WINDOW *<i>win</i>, chtype <i>ch</i>); void wbkgdset(WINDOW *<i>win</i>, chtype <i>ch</i>);</pre>
DESCRIPTION	<p>The <code>bkgdset()</code> and <code>wbkgdset()</code> functions turn off the previous background attributes, logical OR the requested attributes into the window rendition, and set the background property of the current or specified window based on the information in <i>ch</i>. If <i>ch</i> refers to a multi-column character, the results are undefined.</p> <p>The <code>bkgd()</code> and <code>wbkgd()</code> functions turn off the previous background attributes, logical OR the requested attributes into the window rendition, and set the background property of the current or specified window and then apply this setting to every character position in that window:</p> <ul style="list-style-type: none">■ The rendition of every character on the screen is changed to the new window rendition.■ Wherever the former background character appears, it is changed to the new background character. <p>The <code>getbkgd()</code> function extracts the specified window's background character and rendition.</p>
PARAMETERS	<p><i>ch</i> Is the background character to be set.</p> <p><i>win</i> Is a pointer to the window in which the background character is to be set.</p>
RETURN VALUES	<p>Upon successful completion, the <code>bkgd()</code> and <code>wbkgd()</code> functions return OK. Otherwise, they return ERR.</p> <p>The <code>bkgdset()</code> and <code>wbkgdset()</code> functions do not return a value.</p> <p>Upon successful completion, the <code>getbkgd()</code> function returns the specified window's background character and rendition. Otherwise, it returns (chtype) ERR.</p>
ERRORS	No errors are defined.

bkgd(3XCURSES)

USAGE These functions are only guaranteed to operate reliably on character sets in which each character fits into a single byte, whose attributes can be expressed using only constants with the A_ prefix.

ATTRIBUTES See `attributes(5)` for descriptions of the following attributes:

ATTRIBUTE TYPE	ATTRIBUTE VALUE
Interface Stability	Standard
MT-Level	Unsafe

SEE ALSO `addch(3XCURSES)`, `addchstr(3XCURSES)`, `attroff(3XCURSES)`, `bkgnd(3XCURSES)`, `clear(3XCURSES)`, `clrtoeol(3XCURSES)`, `clrtoobot(3XCURSES)`, `erase(3XCURSES)`, `inch(3XCURSES)`, `libcurses(3XCURSES)`, `mvprintw(3XCURSES)`, `attributes(5)`, `standards(5)`

bkgrnd(3XCURSES)

NAME	<code>bkgrnd</code> , <code>bkgrndset</code> , <code>getbkgrnd</code> , <code>wbkgrnd</code> , <code>wbkgrndset</code> , <code>wgetbkgrnd</code> – set or get the background character (and rendition) of window using a complex character
SYNOPSIS	<pre>cc [flag...] file... -I /usr/xpg4/include -L /usr/xpg4/lib \ -R /usr/xpg4/lib -lcurses [library...] c89 [flag...] file... -lcurses [library...] #include <curses.h> int bkgrnd(const cchar_t *wch); void bkgrndset(const cchar_t *wch); int getbkgrnd(cchar_t *wch); int wbkgrnd(WINDOW *win, const cchar_t *wch); void wbkgrndset(WINDOW *win, const cchar_t *wch); int wgetbkgrnd(WINDOW *win, cchar_t *wch);</pre>
DESCRIPTION	<p>The <code>bkgrndset()</code> and <code>wbkgrndset()</code> functions turn off the previous background attributes, logical OR the requested attributes into the window rendition, and set the background property of the current or specified window based on the information in <i>wch</i>.</p> <p>The <code>bkgrnd()</code> and <code>wbkgrnd()</code> functions turn off the previous background attributes, logical OR the requested attributes into the window rendition, and set the background property of the current or specified window and then apply this setting to every character position in that window:</p> <ul style="list-style-type: none">■ The rendition of every character on the screen is changed to the new window rendition.■ Wherever the former background character appears, it is changed to the new background character. <p>If <i>wch</i> refers to a non-spacing complex character for <code>bkgrnd()</code>, <code>bkgrndset()</code>, <code>wbkgrnd()</code>, and <code>wbkgrndset()</code>, then <i>wch</i> is added to the existing spacing complex character that is the background character. If <i>wch</i> refers to a multi-column character, the results are unspecified.</p> <p>The <code>getbkgrnd()</code> and <code>wgetbkgrnd()</code> functions store, into the area pointed to by <i>wch</i>, the window's background character and rendition.</p>
PARAMETERS	<p><i>wch</i> Is a pointer to the complex background character to be set.</p> <p><i>win</i> Is a pointer to the window in which the complex background character is to be set.</p>
RETURN VALUES	<p>The <code>bkgrndset()</code> and <code>wbkgrndset()</code> functions do not return a value.</p> <p>Upon successful completion, the other functions return OK. Otherwise, they return ERR.</p>

bkgnd(3XCURSES)

ERRORS No errors are defined.

ATTRIBUTES See `attributes(5)` for descriptions of the following attributes:

ATTRIBUTE TYPE	ATTRIBUTE VALUE
Interface Stability	Standard
MT-Level	Unsafe

SEE ALSO `add_wch(3XCURSES)`, `add_wchnstr(3XCURSES)`, `addch(3XCURSES)`, `addchstr(3XCURSES)`, `attroff(3XCURSES)`, `bkgd(3XCURSES)`, `clear(3XCURSES)`, `clrtoeol(3XCURSES)`, `clrtobot(3XCURSES)`, `erase(3XCURSES)`, `inch(3XCURSES)`, `libcurses(3XCURSES)`, `mvprintw(3XCURSES)`, `attributes(5)`, `standards(5)`

border(3XCURSES)

NAME border, box, wborder – add a single-byte border to a window

SYNOPSIS `cc [flag...] file... -I /usr/xpg4/include -L /usr/xpg4/lib \`
`-R /usr/xpg4/lib -lcurses [library...]`

```
c89 [ flag... ] file... -lcurses [ library... ]

#include <curses.h>

int border(chtype ls, chtype rs, chtype ts, chtype bs, chtype tl,
           chtype tr, chtype bl, chtype br);

int wborder(WINDOW *win, chtype ls, chtype rs, chtype ts, chtype bs,
            chtype tl, chtype tr, chtype bl, chtype br);

int box(WINDOW *win, chtype verch, chtype horch);
```

DESCRIPTION The `border()` and `wborder()` functions draw a border around the specified window. All parameters must be single-byte characters whose rendition can be expressed using only constants beginning with `ACS_`. A parameter with the value of 0 is replaced by the default value.

Constant Values for Borders		
Parameter	Default Constant	Default Character
<i>verch</i>	ACS_VLINE	
<i>horch</i>	ACS_HLINE	-
<i>ls</i>	ACS_VLINE	
<i>rs</i>	ACS_VLINE	
<i>ts</i>	ACS_HLINE	-
<i>bs</i>	ACS_HLINE	-
<i>bl</i>	ACS_BLCORNER	+
<i>br</i>	ACS_BRCORNER	+
<i>tl</i>	ACS_ULCORNER	+
<i>tr</i>	ACS_URCORNER	+

The call

`box(win,`
`verch, horch)` is a short form for

```
wborder(win,
verch, verch,
horch, horch, 0, 0, 0,
```

0) When the window is boxed, the bottom and top rows and right and left columns overwrite existing text.

border(3XCURSES)

PARAMETERS

<i>ls</i>	Is the character and rendition used for the left side of the border.
<i>rs</i>	Is the character and rendition used for the right side of the border.
<i>ts</i>	Is the character and rendition used for the top of the border.
<i>bs</i>	Is the character and rendition used for the bottom of the border.
<i>tl</i>	Is the character and rendition used for the top-left corner of the border.
<i>tr</i>	Is the character and rendition used for the top-right corner of the border.
<i>bl</i>	Is the character and rendition used for the bottom-left corner of the border.
<i>br</i>	Is the character and rendition used for the bottom-right corner of the border.
<i>win</i>	Is the pointer to the window in which the border or box is to be drawn.
<i>verch</i>	Is the character and rendition used for the left and right columns of the box.
<i>horch</i>	Is the character and rendition used for the top and bottom rows of the box.

RETURN VALUES

On success, these functions return OK. Otherwise, they return ERR.

ERRORS

None.

ATTRIBUTES

See `attributes(5)` for descriptions of the following attributes:

ATTRIBUTE TYPE	ATTRIBUTE VALUE
Interface Stability	Standard
MT-Level	Unsafe

SEE ALSO

`add_wch(3XCURSES)`, `addch(3XCURSES)`, `attr_get(3XCURSES)`, `attroff(3XCURSES)`, `border_set(3XCURSES)`, `libcurses(3XCURSES)`, `attributes(5)`, `standards(5)`

border_set(3XCURSES)

NAME border_set, box_set, wborder_set – use complex characters (and renditions) to draw borders

SYNOPSIS

```
cc [ flag... ] file... -I /usr/xpg4/include -L /usr/xpg4/lib \
-R /usr/xpg4/lib -lcurses [ library... ]

c89 [ flag... ] file... -lcurses [ library... ]

#include <curses.h>

int border_set(const cchar_t *ls, const cchar_t *rs, const cchar_t
    *ts, const cchar_t *bs, const cchar_t *tl, const cchar_t *tr,
    const cchar_t *bl, const cchar_t *br);

int wborder_set(WINDOW *win, const cchar_t *ls, const cchar_t *rs,
    const cchar_t *ts, const cchar_t *bs, const cchar_t *tl, const
    cchar_t *tr, const cchar_t *bl, const cchar_t *br);

int box_set(WINDOW *win, const cchar_t *verch, const cchar_t
    *horch);
```

DESCRIPTION The border_set() and wborder_set() functions draw a border around the specified window. All parameters must be spacing complex characters with renditions. A parameter which is a null pointer is replaced by the default character.

Constant Values for Borders

Constant Values for Borders		
Parameter	Default Constant	Default Character
<i>verch</i>	WACS_VLINE	
<i>horch</i>	WACS_HLINE	-
<i>ls</i>	WACS_VLINE	
<i>rs</i>	WACS_VLINE	
<i>ts</i>	WACS_HLINE	-
<i>bs</i>	WACS_HLINE	-
<i>bl</i>	WACS_BLCORNER	+
<i>br</i>	WACS_BRCORNER	+
<i>tl</i>	WACS_ULCORNER	+
<i>tr</i>	WACS_URCORNER	+

The call

```
box_set(win,
verch, horch) is a short form for
```

```
wborder(win,
        verch, verch,
        horch, horch, NULL,
        NULL, NULL, NULL)
```

When the window is boxed, the bottom and top rows and right and left columns are unavailable for text.

PARAMETERS

ls Is the character and rendition used for the left side of the border.

rs Is the character and rendition used for the right side of the border.

ts Is the character and rendition used for the top of the border.

bs Is the character and rendition used for the bottom of the border.

tl Is the character and rendition used for the top-left corner of the border.

tr Is the character and rendition used for the top-right corner of the border.

bl Is the character and rendition used for the bottom-left corner of the border.

br Is the character and rendition used for the bottom-right corner of the border.

win Is the pointer to the window in which the border or box is to be drawn.

verch Is the character and rendition used for the left and right columns of the box.

horch Is the character and rendition used for the top and bottom rows of the box.

RETURN VALUES

On success, these functions return OK. Otherwise, they return ERR.

ERRORS

None.

ATTRIBUTES

See `attributes(5)` for descriptions of the following attributes:

ATTRIBUTE TYPE	ATTRIBUTE VALUE
Interface Stability	Standard
MT-Level	Unsafe

SEE ALSO

`add_wch(3XCURSES)`, `addch(3XCURSES)`, `attr_get(3XCURSES)`, `attroff(3XCURSES)`, `border(3XCURSES)`, `libcurses(3XCURSES)`, `attributes(5)`, `standards(5)`

can_change_color(3XCURSES)

NAME	can_change_color, color_content, COLOR_PAIR, has_colors, init_color, init_pair, pair_content, PAIR_NUMBER, start_color, COLOR_PAIRS, COLORS – manipulate color information
SYNOPSIS	<pre>cc [flag...] file... -I /usr/xpg4/include -L /usr/xpg4/lib \ -R /usr/xpg4/lib -lcurses [library...] c89 [flag...] file... -lcurses [library...] #include <curses.h> bool can_change_color(void); int color_content(short color, short *red, short *green, short *blue); int COLOR_PAIR(int n); bool has_colors(void); int init_color(short color, short red, short green, short blue); int init_pair(short pair, short f, short b); int pair_content(short pair, short *f, short *b); int PAIR_NUMBER(int value); int start_color(void); extern int COLOR_PAIRS; extern int COLORS;</pre>
DESCRIPTION	These functions manipulate color on terminals that support color.
Querying Capabilities	The has_colors() function indicates whether the terminal is a color terminal. The can_change_color() function indicates whether the terminal is a color terminal on which colors can be redefined.
Initialization	<p>The start_color() function must be called to enable use of colors and before any color manipulation function is called. The function initializes eight basic colors (black, red, green, yellow, blue, magenta, cyan, and white) that can be specified by the color macros (such as COLOR_BLACK) defined in <curses.h>. The initial appearance of these colors is unspecified.</p> <p>The function also initializes two global external variables:</p> <ul style="list-style-type: none">■ COLORS defines the number of colors that the terminal supports. See Color Identification below. If COLORS is 0, the terminal does not support redefinition of colors and can_change_color() will return FALSE.■ COLOR_PAIRS defines the maximum number of color-pairs that the terminal supports. See User-defined Color Pairs below.

can_change_color(3XCURSES)

Color Identification

The `start_color()` function also restores the colors on the terminal to terminal-specific initial values. The initial background color is assumed to be black for all terminals.

The `init_color()` function redefines color number *color*, on terminals that support the redefinition of colors, to have the red, green, and blue intensity components specified by *red*, *green*, and *blue*, respectively. Calling `init_color()` also changes all occurrences of the specified color on the screen to the new definition.

The `color_content()` function identifies the intensity components of color number *color*. It stores the red, green, and blue intensity components of this color in the addresses pointed to by *red*, *green*, and *blue*, respectively.

For both functions, the *color* argument must be in the range from 0 to and including `COLORS-1`. Valid intensity value range from 0 (no intensity component) up to and including 1000 (maximum intensity in that component).

User-defined Color Pairs

Calling `init_pair()` defines or redefines color-pair number *pair* to have foreground color *f* and background color *b*. Calling `init_pair()` changes any characters that were displayed in the color pair's old definition to the new definition and refreshes the screen.

After defining the color pair, the macro `COLOR_PAIR(n)` returns the value of color pair *n*. This value is the color attribute as it would be extracted from a `chtype`. Controversy, the macro `COLOR_NUMBER(value)` returns the color pair number associated with the color attribute *value*.

The `pair_content()` retrieves the component colors of a color-pair number *pair*. It stores the foreground and background color numbers in the variables pointed to by *f* and *b*, respectively.

With `init_pair()` and `pair_content()`, the value of *pair* must be in a range from 0 to and including `COLOR_PAIRS-1`. Valid values for *f* and *b* are the range from 0 to and including `COLORS-1`.

PARAMETERS

<i>color</i>	Is the number of the color for which to provide information (0 to <code>COLORS-1</code>).
<i>red</i>	Is a pointer to the RGB value for the amount of red in <i>color</i> .
<i>green</i>	Is a pointer to the RGB value for the amount of green in <i>color</i> .
<i>blue</i>	Is a pointer to the RGB value for the amount of blue in <i>color</i> .
<i>n</i>	Is the number of a color pair.
<i>pair</i>	Is the number of the color pair for which to provide information (1 to <code>COLOR_PAIRS-1</code>).
<i>f</i>	Is a pointer to the number of the foreground color (0 to <code>COLORS-1</code>) in <i>pair</i> .

can_change_color(3XCURSES)

b Is a pointer to the number of the background color (0 to COLORS-1) in *pair*.

value Is a color attribute value.

RETURN VALUES The `has_colors()` function returns `TRUE` if the terminal can manipulate colors. Otherwise, it returns `FALSE`.

The `can_change_color()` function returns `TRUE` if the terminal supports colors and is able to change their definitions. Otherwise, it returns `FALSE`.

Upon successful completion, the other functions return `OK`. Otherwise, they return `ERR`.

ERRORS No errors are defined.

USAGE To use these functions, `start_color()` must be called, usually right after `initscr(3XCURSES)`.

The `can_change_color()` and `has_colors()` functions facilitate writing terminal-independent applications. For example, a programmer can use them to decide whether to use color or some other video attribute.

On color terminals, a typical value of `COLORS` is 8 and the macros such as `COLOR_BLACK` return a value within the range from 0 to and including 7. However, applications cannot rely on this to be true.

ATTRIBUTES See `attributes(5)` for descriptions of the following attributes:

ATTRIBUTE TYPE	ATTRIBUTE VALUE
Interface Stability	Standard
MT-Level	Unsafe

SEE ALSO `attroff(3XCURSES)`, `delscreen(3XCURSES)`, `initscr(3XCURSES)`, `libcurses(3XCURSES)`, `attributes(5)`, `standards(5)`

NAME	cbreak, nocbreak, noraw, raw – set input mode controls						
SYNOPSIS	<pre>cc [flag...] file... -I /usr/xpg4/include -L /usr/xpg4/lib \ -R /usr/xpg4/lib -lcurses [library...] c89 [flag...] file... -lcurses [library...] #include <curses.h> int cbreak(void); int nocbreak(void); int noraw(void); int raw(void);</pre>						
DESCRIPTION	<p>The <code>cbreak()</code> function enables the character input mode. This overrides any previous call to the <code>raw()</code> function and turns the <code>stty</code> flag <code>ICANON</code> off.</p> <p>The <code>nocbreak()</code> function sets the line canonical mode and turns the <code>stty</code> flag <code>ICANON</code> on without touching the <code>ISIG</code> or <code>IXON</code> flags.</p> <p>The <code>noraw()</code> function sets the line canonical mode and turns the the <code>stty</code> flags <code>ICANON</code>, <code>ISIG</code>, and <code>IXON</code> all on.</p> <p>The <code>raw()</code> function sets the character input mode and turns the <code>stty</code> flags <code>ICANON</code>, <code>ISIG</code>, and <code>IXON</code> all off. This mode provides maximum control over input.</p> <p>It is important to remember that the terminal may or may not be in character mode operation initially. Most interactive programs require <code>cbreak()</code> to be enabled.</p>						
RETURN VALUES	On success, these functions return <code>OK</code> . Otherwise, they return <code>ERR</code> .						
ERRORS	None.						
ATTRIBUTES	See <code>attributes(5)</code> for descriptions of the following attributes:						
	<table border="1"> <thead> <tr> <th>ATTRIBUTE TYPE</th> <th>ATTRIBUTE VALUE</th> </tr> </thead> <tbody> <tr> <td>Interface Stability</td> <td>Standard</td> </tr> <tr> <td>MT-Level</td> <td>Unsafe</td> </tr> </tbody> </table>	ATTRIBUTE TYPE	ATTRIBUTE VALUE	Interface Stability	Standard	MT-Level	Unsafe
ATTRIBUTE TYPE	ATTRIBUTE VALUE						
Interface Stability	Standard						
MT-Level	Unsafe						
SEE ALSO	<code>getch(3XCURSES)</code> , <code>halfdelay(3XCURSES)</code> , <code>nodelay(3XCURSES)</code> , <code>timeout(3XCURSES)</code> , <code>libcurses(3XCURSES)</code> , <code>attributes(5)</code> , <code>standards(5)</code> , <code>termio(7I)</code>						

chgat(3XCURSES)

NAME	chgat, mvchgat, mvwchgat, wchgat – change the rendition of characters in a window														
SYNOPSIS	<pre>cc [flag...] file... -I /usr/xpg4/include -L /usr/xpg4/lib \ -R /usr/xpg4/lib -lcurses [library...] c89 [flag...] file... -lcurses [library...] #include <curses.h> int chgat(int <i>n</i>, attr_t <i>attr</i>, short <i>color</i>, const void *<i>opts</i>); int mvchgat(int <i>y</i>, int <i>x</i>, int <i>n</i>, attr_t <i>attr</i>, short <i>color</i>, const void *<i>opts</i>); int mvwchgat(WINDOW *<i>win</i>, int <i>y</i>, int <i>x</i>, int <i>n</i>, attr_t <i>attr</i>, short <i>color</i>, const void *<i>opts</i>); int wchgat(WINDOW *<i>win</i>, int <i>n</i>, attr_t <i>attr</i>, short <i>color</i>, const void *<i>opts</i>);</pre>														
DESCRIPTION	<p>These functions change the renditions of the next <i>n</i> characters in the current or specified window (or of the remaining characters on the current or specified line, if <i>n</i> is -1), beginning at the current or specified cursor position. The attributes and colors are specified by <i>attr</i> and <i>color</i> as for <code>setcchar(3XCURSES)</code>.</p> <p>These function neither update the cursor nor perform wrapping.</p> <p>A value of <i>n</i> that is greater than the remaining characters on a line is not an error.</p> <p>The <i>opts</i> argument is reserved for definition in a future release. Currently, the application must provide a null pointer for <i>opts</i>.</p>														
PARAMETERS	<table><tr><td><i>n</i></td><td>Is the number of characters whose rendition is to be changed.</td></tr><tr><td><i>attr</i></td><td>Is the set of attributes to be assigned to the characters.</td></tr><tr><td><i>color</i></td><td>Is the new color pair to be assigned to the characters.</td></tr><tr><td><i>opts</i></td><td>Is reserved for future use. Currently, this must be a null pointer.</td></tr><tr><td><i>y</i></td><td>Is the y (row) coordinate of the starting position in the window.</td></tr><tr><td><i>x</i></td><td>Is the x (column) coordinate of the starting position in the window. changed in the window.</td></tr><tr><td><i>win</i></td><td>Is a pointer to the window in which the rendition of characters is to be changed.</td></tr></table>	<i>n</i>	Is the number of characters whose rendition is to be changed.	<i>attr</i>	Is the set of attributes to be assigned to the characters.	<i>color</i>	Is the new color pair to be assigned to the characters.	<i>opts</i>	Is reserved for future use. Currently, this must be a null pointer.	<i>y</i>	Is the y (row) coordinate of the starting position in the window.	<i>x</i>	Is the x (column) coordinate of the starting position in the window. changed in the window.	<i>win</i>	Is a pointer to the window in which the rendition of characters is to be changed.
<i>n</i>	Is the number of characters whose rendition is to be changed.														
<i>attr</i>	Is the set of attributes to be assigned to the characters.														
<i>color</i>	Is the new color pair to be assigned to the characters.														
<i>opts</i>	Is reserved for future use. Currently, this must be a null pointer.														
<i>y</i>	Is the y (row) coordinate of the starting position in the window.														
<i>x</i>	Is the x (column) coordinate of the starting position in the window. changed in the window.														
<i>win</i>	Is a pointer to the window in which the rendition of characters is to be changed.														
RETURN VALUES	Upon successful completion, these functions returned OK. Otherwise, they return ERR.														
ERRORS	No errors are defined.														

chgat(3XCURSES)

ATTRIBUTES See `attributes(5)` for descriptions of the following attributes:

ATTRIBUTE TYPE	ATTRIBUTE VALUE
Interface Stability	Standard
MT-Level	Unsafe

SEE ALSO `bkgrnd(3XCURSES)`, `libcurses(3XCURSES)`, `setcchar(3XCURSES)`, `attributes(5)`, `standards(5)`

clear(3XCURSES)

NAME	clear, erase, wclear, werase – clear a window						
SYNOPSIS	<pre>cc [flag...] file... -I /usr/xpg4/include -L /usr/xpg4/lib \ -R /usr/xpg4/lib -lcurses [library...] c89 [flag...] file... -lcurses [library...] #include <curses.h> int clear(void); int erase(void); int wclear(WINDOW *win); int werase(WINDOW *win);</pre>						
DESCRIPTION	<p>The <code>clear()</code> and <code>erase()</code> functions clear <code>stdscr</code>, destroying its previous contents. The <code>wclear()</code> and <code>werase()</code> functions perform the same action, but clear the window specified by <code>win</code> instead of <code>stdscr</code>.</p> <p>The <code>clear()</code> and <code>wclear()</code> functions also call the <code>clearok()</code> function. This function clears and redraws the entire screen on the next call to <code>refresh(3XCURSES)</code> or <code>wrefresh(3XCURSES)</code> for the window.</p> <p>The current background character (and attributes) is used to clear the screen.</p>						
PARAMETERS	<table><tr><td><i>win</i></td><td>Is a pointer to the window that is to be cleared.</td></tr></table>	<i>win</i>	Is a pointer to the window that is to be cleared.				
<i>win</i>	Is a pointer to the window that is to be cleared.						
ERRORS	<table><tr><td>OK</td><td>Successful completion.</td></tr><tr><td>ERR</td><td>An error occurred.</td></tr></table>	OK	Successful completion.	ERR	An error occurred.		
OK	Successful completion.						
ERR	An error occurred.						
ATTRIBUTES	See <code>attributes(5)</code> for descriptions of the following attributes:						
	<table border="1"><thead><tr><th>ATTRIBUTE TYPE</th><th>ATTRIBUTE VALUE</th></tr></thead><tbody><tr><td>Interface Stability</td><td>Standard</td></tr><tr><td>MT-Level</td><td>Unsafe</td></tr></tbody></table>	ATTRIBUTE TYPE	ATTRIBUTE VALUE	Interface Stability	Standard	MT-Level	Unsafe
ATTRIBUTE TYPE	ATTRIBUTE VALUE						
Interface Stability	Standard						
MT-Level	Unsafe						
SEE ALSO	<code>bkgdset(3XCURSES)</code> , <code>clearok(3XCURSES)</code> , <code>clrtoeol(3XCURSES)</code> , <code>doupdate(3XCURSES)</code> , <code>libcurses(3XCURSES)</code> , <code>refresh(3XCURSES)</code> , <code>wrefresh(3XCURSES)</code> , <code>attributes(5)</code> , <code>standards(5)</code>						

NAME	clearok, idlok, leaveok, scrollok, setscrreg, wsetscrreg – terminal output control functions
SYNOPSIS	<pre>cc [flag...] file... -I /usr/xpg4/include -L /usr/xpg4/lib \ -R /usr/xpg4/lib -lcurses [library...] c89 [flag...] file... -lcurses [library...] #include <curses.h> int clearok(WINDOW *win, bool bf); int idlok(WINDOW *win, bool bf); int leaveok(WINDOW *win, bool bf); int scrollok(WINDOW *win, bool bf); int setscrreg(int top, int bot); int wsetscrreg(WINDOW *win, int top, int bot);</pre>
DESCRIPTION	<p>These functions set options that deal with the output within Curses functions.</p> <p>The <code>clearok()</code> function assigns the value of <i>bf</i> to an internal flag in the specified window that governs clearing of the screen during a refresh. If, during a refresh operation on the specified window, the flag in <i>curscr</i> is TRUE or the flag in the specified window is TRUE, <code>clearok()</code> clears the screen, redraws it in its entirety, and sets the flag to FALSE in <i>curscr</i> and in the specified window. The initial state is unspecified</p> <p>The <code>idlok()</code> function specifies whether the implementation may use the hardware insert-line, delete-line, and scroll features of terminals so equipped. If <i>bf</i> is TRUE, use of these features is enabled. If <i>bf</i> is FALSE, use of these features is disabled and lines are instead redrawn as required. The initial state is FALSE.</p> <p>The <code>leaveok()</code> function controls the cursor position after a refresh operation. If <i>bf</i> is TRUE, refresh operations on the specified window may leave the terminal's cursor at an arbitrary position. If <i>bf</i> is FALSE, then at the end of any refresh operation, the terminal's cursor is positioned at the cursor position contained in the specified window. The initial state is FALSE.</p> <p>The <code>scrollok()</code> function controls the use of scrolling. If <i>bf</i> is TRUE, then scrolling is enabled for the specified window. If <i>bf</i> is FALSE, scrolling is disabled for the specified window. The initial state is FALSE.</p> <p>The <code>setscrreg()</code> and <code>wsetscrreg()</code> functions define a software scrolling region in the current or specified window. The <i>top</i> and <i>bottom</i> arguments are the line numbers of the first and last line defining the scrolling region. (Line 0 is the top line of the window.) If this option and <code>scrollok()</code> are enabled, an attempt to move off the last line of the margin causes all lines in the scrolling region to scroll one line in the</p>

clearok(3XCURSES)

direction of the first line. Only characters in the window are scrolled. If a software scrolling region is set and `scrollok()` is not enabled, an attempt to move off the last line of the margin does not reposition any lines in the scrolling region.

PARAMETERS

win Is a pointer to a window.
bf Is a Boolean expression.
top Is the top line of the scrolling region (top of the window is line 0).
bot Is the bottom line of the scrolling region (top of the window is line 0).

RETURN VALUES

Upon successful completion, the `setscrreg()` and `wsetscrreg()` functions return OK. Otherwise, they return ERR.

The other functions always return OK.

ERRORS

No errors are defined.

USAGE

The only reason to enable the `idlok()` feature is to use scrolling to achieve the visual effect of motion of a partial window, such as for a screen editor. In other cases, the feature can be visually annoying.

The `leaveok()` option provides greater efficiency for applications that do not use the cursor.

ATTRIBUTES

See `attributes(5)` for descriptions of the following attributes:

ATTRIBUTE TYPE	ATTRIBUTE VALUE
Interface Stability	Standard
MT-Level	Unsafe

SEE ALSO

`bkgdset(3XCURSES)`, `clear(3XCURSES)`, `doupdate(3XCURSES)`, `libcurses(3XCURSES)`, `scr1(3XCURSES)`, `attributes(5)`, `standards(5)`

NAME	clrtoBot, wclrtoBot – clear to the end of a window						
SYNOPSIS	<pre>cc [flag...] file... -I /usr/xpg4/include -L /usr/xpg4/lib \ -R /usr/xpg4/lib -lcurses [library...] c89 [flag...] file... -lcurses [library...] #include <curses.h> int clrtoBot(void); int wclrtoBot(WINDOW *win);</pre>						
DESCRIPTION	<p>The <code>clrtoBot()</code> function clears all characters in the <code>stdscr</code> window from the cursor to the end of the window. The <code>wclrtoBot()</code> function performs the same action in the window specified by <i>win</i> instead of in <code>stdscr</code>. The current background character (and rendition) is used to clear the screen.</p> <p>If the clearing action results in clearing only a portion of a multicolumn character, background characters are displayed in place of the remaining portion.</p>						
PARAMETERS	<p><i>win</i> Is a pointer to the window that is to be cleared.</p>						
RETURN VALUES	On success, these functions return OK. Otherwise, they return ERR.						
ERRORS	None.						
ATTRIBUTES	See <code>attributes(5)</code> for descriptions of the following attributes:						
	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">ATTRIBUTE TYPE</th> <th style="text-align: center;">ATTRIBUTE VALUE</th> </tr> </thead> <tbody> <tr> <td>Interface Stability</td> <td>Standard</td> </tr> <tr> <td>MT-Level</td> <td>Unsafe</td> </tr> </tbody> </table>	ATTRIBUTE TYPE	ATTRIBUTE VALUE	Interface Stability	Standard	MT-Level	Unsafe
ATTRIBUTE TYPE	ATTRIBUTE VALUE						
Interface Stability	Standard						
MT-Level	Unsafe						
SEE ALSO	<code>bkgdset(3XCURSES)</code> , <code>clear(3XCURSES)</code> , <code>clearok(3XCURSES)</code> , <code>crltoeol(3XCURSES)</code> , <code>libcurses(3XCURSES)</code> , <code>attributes(5)</code> , <code>standards(5)</code>						

clrtoeol(3XCURSES)

NAME clrtoeol, wclrtoeol – clear to the end of a line

SYNOPSIS

```
cc [ flag... ] file... -I /usr/xpg4/include -L /usr/xpg4/lib \
-R /usr/xpg4/lib -lcurses [ library... ]

c89 [ flag... ] file... -lcurses [ library... ]

#include <curses.h>

int clrtoeol(void);

int wclrtoeol(WINDOW *win);
```

DESCRIPTION The `clrtoeol()` function clears the current line from the cursor to the right margin in the `stdscr` window. The `wclrtoeol()` function performs the same action, but in the window specified by `win` instead of `stdscr`. The current background character (and rendition) is used to clear the screen.

If the clearing action results in clearing only a portion of a multicolumn character, background characters are displayed in place of the remaining portion.

PARAMETERS `win` Is a pointer to the window in which to clear to the end of the line.

RETURN VALUES On success, these functions return `OK`. Otherwise, they return `FALSE`.

ERRORS None.

ATTRIBUTES See `attributes(5)` for descriptions of the following attributes:

ATTRIBUTE TYPE	ATTRIBUTE VALUE
Interface Stability	Standard
MT-Level	Unsafe

SEE ALSO `bkgdset(3XCURSES)`, `clear(3XCURSES)`, `clearok(3XCURSES)`, `clrtoeol(3XCURSES)`, `libcurses(3XCURSES)`, `attributes(5)`, `standards(5)`

NAME COLS – number of columns on terminal screen

SYNOPSIS

```
cc [ flag... ] file... -I /usr/xpg4/include -L /usr/xpg4/lib \
-R /usr/xpg4/lib -lcurses [ library... ]

c89 [ flag... ] file... -lcurses [ library ... ]

#include <curses.h>

extern int COLS;
```

DESCRIPTION The external variable COLS indicates the number of columns on the terminal screen.

ATTRIBUTES See attributes(5) for descriptions of the following attributes:

ATTRIBUTE TYPE	ATTRIBUTE VALUE
Interface Stability	Standard
MT-Level	Unsafe

SEE ALSO `initscr(3XCURSES)`, `libcurses(3XCURSES)`, `attributes(5)`, `standards(5)`

copywin(3XCURSES)

NAME	copywin – overlay or overwrite any portion of window																		
SYNOPSIS	<pre>cc [flag...] file... -I /usr/xpg4/include -L /usr/xpg4/lib \ -R /usr/xpg4/lib -lcurses [library...] c89 [flag...] file... -lcurses [library...] #include <curses.h> int copywin(const WINDOW *srcwin, WINDOW *dstwin, int sminrow, int smincol, int dminrow, int dmincol, int dmaxrow, int dmaxcol, int overlay);</pre>																		
PARAMETERS	<table><tr><td><i>srcwin</i></td><td>Is a pointer to the source window to be copied.</td></tr><tr><td><i>dstwin</i></td><td>Is a pointer to the destination window to be overlaid or overwritten.</td></tr><tr><td><i>sminrow</i></td><td>Is the row coordinate of the upper left corner of the rectangular area on the source window to be copied.</td></tr><tr><td><i>smincol</i></td><td>Is the column coordinate of the upper left corner of the rectangular area on the source window to be copied.</td></tr><tr><td><i>dminrow</i></td><td>Is the row coordinate of the upper left corner of the rectangular area on the destination window to be overlaid or overwritten.</td></tr><tr><td><i>dmincol</i></td><td>Is the column coordinate of the upper left corner of the rectangular area on destination window to be overlaid or overwritten.</td></tr><tr><td><i>dmaxrow</i></td><td>Is the row coordinate of the lower right corner of the rectangular area on the destination window to be overlaid or overwritten.</td></tr><tr><td><i>dmaxcol</i></td><td>Is the column coordinate of the lower right corner of the rectangular area on the destination window to be overlaid or overwritten.</td></tr><tr><td><i>overlay</i></td><td>Is a TRUE or FALSE value that determines whether the destination window is overlaid or overwritten.</td></tr></table>	<i>srcwin</i>	Is a pointer to the source window to be copied.	<i>dstwin</i>	Is a pointer to the destination window to be overlaid or overwritten.	<i>sminrow</i>	Is the row coordinate of the upper left corner of the rectangular area on the source window to be copied.	<i>smincol</i>	Is the column coordinate of the upper left corner of the rectangular area on the source window to be copied.	<i>dminrow</i>	Is the row coordinate of the upper left corner of the rectangular area on the destination window to be overlaid or overwritten.	<i>dmincol</i>	Is the column coordinate of the upper left corner of the rectangular area on destination window to be overlaid or overwritten.	<i>dmaxrow</i>	Is the row coordinate of the lower right corner of the rectangular area on the destination window to be overlaid or overwritten.	<i>dmaxcol</i>	Is the column coordinate of the lower right corner of the rectangular area on the destination window to be overlaid or overwritten.	<i>overlay</i>	Is a TRUE or FALSE value that determines whether the destination window is overlaid or overwritten.
<i>srcwin</i>	Is a pointer to the source window to be copied.																		
<i>dstwin</i>	Is a pointer to the destination window to be overlaid or overwritten.																		
<i>sminrow</i>	Is the row coordinate of the upper left corner of the rectangular area on the source window to be copied.																		
<i>smincol</i>	Is the column coordinate of the upper left corner of the rectangular area on the source window to be copied.																		
<i>dminrow</i>	Is the row coordinate of the upper left corner of the rectangular area on the destination window to be overlaid or overwritten.																		
<i>dmincol</i>	Is the column coordinate of the upper left corner of the rectangular area on destination window to be overlaid or overwritten.																		
<i>dmaxrow</i>	Is the row coordinate of the lower right corner of the rectangular area on the destination window to be overlaid or overwritten.																		
<i>dmaxcol</i>	Is the column coordinate of the lower right corner of the rectangular area on the destination window to be overlaid or overwritten.																		
<i>overlay</i>	Is a TRUE or FALSE value that determines whether the destination window is overlaid or overwritten.																		
DESCRIPTION	The <code>copywin()</code> function provides a finer granularity of control over the <code>overlay(3XCURSES)</code> and <code>overwrite(3XCURSES)</code> functions. As in the <code>prefresh()</code> function (see <code>newpad(3XCURSES)</code>), a rectangle is specified in the destination window, (<i>dminrow</i> , <i>dmincol</i>) and (<i>dmaxrow</i> , <i>dmaxcol</i>), and the upper-left-corner coordinates of the source window, (<i>smincol</i> , <i>sminrow</i>). If <i>overlay</i> is TRUE, then copying is non-destructive, as in <code>overlay()</code> . If <i>overlay</i> is FALSE, then copying is destructive, as in <code>overwrite()</code> .																		
RETURN VALUES	Upon successful completion, the <code>copywin()</code> function returns OK. Otherwise, it returns ERR.																		

copywin(3XCURSES)

ERRORS No errors are defined.

ATTRIBUTES See `attributes(5)` for descriptions of the following attributes:

ATTRIBUTE TYPE	ATTRIBUTE VALUE
Interface Stability	Standard
MT-Level	Unsafe

SEE ALSO `curses(3XCURSES)`, `libcurses(3XCURSES)`, `newpad(3XCURSES)`, `overlay(3XCURSES)`, `attributes(5)`, `standards(5)`

curs_addch(3CURSES)

NAME	curs_addch, addch, waddch, mvaddch, mvwaddch, echochar, wechochar – add a character (with attributes) to a curses window and advance cursor
SYNOPSIS	<pre>cc [flag ...] file ... -lcurses [library ..] #include <curses.h> int addch(chtype ch); int waddch(WINDOW *win, chtype ch); int mvaddch(int y, int x, chtype ch); int mvwaddch(WINDOW *win, int y, int x, chtype ch); int echochar(chtype ch); int wechochar(WINDOW *win, chtype ch);</pre>
DESCRIPTION	<p>With the <code>addch()</code>, <code>waddch()</code>, <code>mvaddch()</code>, and <code>mvwaddch()</code> routines, the character <code>ch</code> is put into the window at the current cursor position of the window and the position of the window cursor is advanced. Its function is similar to that of <code>putchar()</code>. At the right margin, an automatic newline is performed. At the bottom of the scrolling region, if <code>scrollok()</code> is enabled, the scrolling region is scrolled up one line.</p> <p>If <code>ch</code> is a tab, newline, or backspace, the cursor is moved appropriately within the window. A newline also does a <code>clrtoeol()</code> before moving. Tabs are considered to be at every eighth column. If <code>ch</code> is another control character, it is drawn in the <code>^X</code> notation. Calling <code>winch()</code> after adding a control character does not return the control character, but instead returns the representation of the control character. See <code>curs_inch(3CURSES)</code>.</p> <p>Video attributes can be combined with a character by OR-ing them into the parameter. This results in these attributes also being set. (The intent here is that text, including attributes, can be copied from one place to another using <code>inch()</code> and <code>addch()</code>.) (see <code>standout()</code>, predefined video attribute constants, on the <code>curs_attr(3CURSES)</code> page).</p> <p>The <code>echochar()</code> and <code>wechochar()</code> routines are functionally equivalent to a call to <code>addch()</code> followed by a call to <code>refresh()</code>, or a call to <code>waddch</code> followed by a call to <code>wrefresh()</code>. The knowledge that only a single character is being output is taken into consideration and, for non-control characters, a considerable performance gain might be seen by using these routines instead of their equivalents.</p>
Line Graphics	<p>The following variables may be used to add line drawing characters to the screen with routines of the <code>addch()</code> family. When variables are defined for the terminal, the <code>A_ALTCHARSET</code> bit is turned on (see <code>curs_attr(3CURSES)</code>). Otherwise, the default character listed below is stored in the variable. The names chosen are consistent with the VT100 nomenclature.</p>

curs_addch(3CURSES)

Name	Default	Glyph Description
ACS_ULCORNER	+	upper left-hand corner
ACS_LLCORNER	+	lower left-hand corner
ACS_URCORNER	+	upper right-hand corner
ACS_LRCORNER	+	lower right-hand corner
ACS_RTEE	+	right tee
ACS_LTEE	+	left tee
ACS_BTEE	+	bottom tee
ACS_TTEE	+	top tee
ACS_HLINE	-	horizontal line
ACS_VLINE		vertical line
ACS_PLUS	+	plus
ACS_S1	-	scan line 1
ACS_S9	-	scan line 9
ACS_DIAMOND	+	diamond
ACS_CKBOARD	:	checker board (stipple)
ACS_DEGREE	'	degree symbol
ACS_PLMINUS	#	plus/minus
ACS_BULLET	o	bullet
ACS_LARROW	<	arrow pointing left
ACS_RARROW	>	arrow pointing right
ACS_DARROW	v	arrow pointing down
ACS_UARROW	^	arrow pointing up
ACS_BOARD	#	board of squares
ACS_LANTERN	#	lantern symbol
ACS_BLOCK	#	solid square block

RETURN VALUES

All routines return the integer `ERR` upon failure and an integer value other than `ERR` upon successful completion.

curl_addch(3CURSES)

ATTRIBUTES See attributes(5) for descriptions of the following attributes:

ATTRIBUTE TYPE	ATTRIBUTE VALUE
MT-Level	Unsafe

SEE ALSO curl_attr(3CURSES), curl_clear(3CURSES), curl_inch(3CURSES), curl_outopts(3CURSES), curl_refresh(3CURSES), curses(3CURSES), putc(3C), attributes(5)

NOTES The header <curls.h> automatically includes the headers <stdio.h> and <unctrl.h>.

Note that addch(), mvaddch(), mvwaddch(), and echochar() may be macros.

NAME	curs_addchstr, addchstr, addchnstr, waddchstr, waddchnstr, mvaddchstr, mvaddchnstr, mvwaddchstr, mvwaddchnstr – add string of characters and attributes to a curses window				
SYNOPSIS	<pre>cc [flag ...] file ... -lcurses [library ...] #include <curses.h> int addchstr(chtype *chstr); int addchnstr(chtype *chstr, int n); int waddchstr(WINDOW *win, chtype *chstr); int waddchnstr(WINDOW *win, chtype *chstr, int n); int mvaddchstr(int y, int x, chtype *chstr); int mvaddchnstr(int y, int x, chtype *chstr, int n); int mvwaddchstr(WINDOW *win, int y, int x, chtype *chstr); int mvwaddchnstr(WINDOW *win, int y, int x, chtype *chstr, int n);</pre>				
DESCRIPTION	<p>All of these routines copy <i>chstr</i> directly into the window image structure starting at the current cursor position. The four routines with <i>n</i> as the last argument copy at most <i>n</i> elements, but no more than will fit on the line. If <i>n</i>=-1 then the whole string is copied, to the maximum number that fit on the line.</p> <p>The position of the window cursor is not advanced. These routines works faster than <code>waddnstr()</code> (see <code>curs_addstr(3CURSES)</code>) because they merely copy <i>chstr</i> into the window image structure. On the other hand, care must be taken when using these functions because they do not perform any kind of checking (such as for the newline character), they do not advance the current cursor position, and they truncate the string, rather than wrapping it around to the next line.</p>				
RETURN VALUES	All routines return the integer <code>ERR</code> upon failure and an integer value other than <code>ERR</code> upon successful completion.				
ATTRIBUTES	See <code>attributes(5)</code> for descriptions of the following attributes:				
	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">ATTRIBUTE TYPE</th> <th style="text-align: center;">ATTRIBUTE VALUE</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">MT-Level</td> <td style="text-align: center;">Unsafe</td> </tr> </tbody> </table>	ATTRIBUTE TYPE	ATTRIBUTE VALUE	MT-Level	Unsafe
ATTRIBUTE TYPE	ATTRIBUTE VALUE				
MT-Level	Unsafe				
SEE ALSO	<code>curs_addstr(3CURSES)</code> , <code>curses(3CURSES)</code> , <code>attributes(5)</code>				
NOTES	<p>The header <code><curses.h></code> automatically includes the headers <code><stdio.h></code> and <code><unctrl.h></code>.</p> <p>Note that all routines except <code>waddchnstr()</code> and <code>waddchstr()</code> may be macros.</p>				

curs_addstr(3CURSES)

NAME | curs_addstr, addstr, addnstr, waddstr, waddnstr, mvaddstr, mvaddnstr, mvwaddstr, mvwaddnstr – add a string of characters to a curses window and advance cursor

SYNOPSIS | `cc [flag ...] file ... -lcurses [library ...]`
| `#include <curses.h>`
|
| `int addstr(char *str);`
| `int addnstr(char *str, int n);`
| `int waddstr(WINDOW *win, char *str);`
| `int waddnstr(WINDOW *win, char *str, int n);`
| `int mvaddstr(int y, int x, char *str);`
| `int mvaddnstr(int y, int x, char *str, int n);`
| `int mvwaddstr(WINDOW *win, int y, int x, char *str);`
| `int mvwaddnstr(WINDOW *win, int y, int x, char *str, int n);`

DESCRIPTION | All of these routines write all the characters of the null terminated character string *str* on the given window. It is similar to calling `waddch()` once for each character in the string. The four routines with *n* as the last argument write at most *n* characters. If *n* is negative, then the entire string will be added.

RETURN VALUES | All routines return the integer `ERR` upon failure and an integer value other than `ERR` upon successful completion.

ATTRIBUTES | See `attributes(5)` for descriptions of the following attributes:

ATTRIBUTE TYPE	ATTRIBUTE VALUE
MT-Level	Unsafe

SEE ALSO | `curs_addch(3CURSES)`, `curses(3CURSES)`, `attributes(5)`

NOTES | The header `<curses.h>` automatically includes the headers `<stdio.h>` and `<unctrl.h>`.

Note that all routines except `waddstr()` and `waddnstr()` may not be macros.

NAME	curs_addwch, addwch, waddwch, mvaddwch, mvwaddwch, echowchar, wechowchar – add a wchar_t character (with attributes) to a curses window and advance cursor
SYNOPSIS	<pre>cc [flag...] file... -lcurses [library...] #include<curses.h> int addwch(chtype wch); int waddwch(WINDOW *win, chtype wch); int mvaddwch(int y, int x, chtype wch); int mvwaddwch(WINDOW *win, int y, int x, chtype wch); int echowchar(chtype wch); int wechowchar(WINDOW *win, chtype wch);</pre>
DESCRIPTION	<p>The addwch(), waddwch(), mvaddwch(), and mvwaddwch() routines put the character <i>wch</i>, holding a wchar_t character, into the window at the current cursor position of the window and advance the position of the window cursor. Their function is similar to that of putwchar(3C) in the C multibyte library. At the right margin, an automatic newline is performed. At the bottom of the scrolling region, if scrolllok is enabled, the scrolling region is scrolled up one line.</p> <p>If <i>wch</i> is a tab, newline, or backspace, the cursor is moved appropriately within the window. A newline also does a clrtoeol(3CURSES) before moving. Tabs are considered to be at every eighth column. If <i>wch</i> is another control character, it is drawn in the ^X notation. Calling winwch(3CURSES) after adding a control character does not return the control character, but instead returns the representation of the control character.</p> <p>Video attributes can be combined with a wchar_t character by OR-ing them into the parameter. This results in these attributes also being set. (The intent here is that text, including attributes, can be copied from one place to another using inwch() and addwch().) See standout(3CURSES), predefined video attribute constants.</p> <p>The echowchar() and wechowchar() routines are functionally equivalent to a call to addwch() followed by a call to refresh(3CURSES), or a call to waddwch() followed by a call to wrefresh(3CURSES). The knowledge that only a single character is being output is taken into consideration and, for non-control characters, a considerable performance gain might be seen by using these routines instead of their equivalents.</p>
Line Graphics	<p>The following variables may be used to add line drawing characters to the screen with routines of the addwch() family. When variables are defined for the terminal, the A_ALTCHARSET bit is turned on. (See curs_attr(3CURSES)). Otherwise, the default character listed below is stored in the variable. The names chosen are consistent with the VT100 nomenclature.</p>

curs_addwch(3CURSES)

Name	Default	Glyph Description
ACS_ULCORNER	+	upper left-hand corner
ACS_LLCORNER	+	lower left-hand corner
ACS_URCORNER	+	upper right-hand corner
ACS_LRCORNER	+	lower right-hand corner
ACS_RTEE	+	right tee
ACS_LTEE	+	left tee
ACS_BTEE	+	bottom tee
ACS_TTEE	+	top tee
ACS_HLINE	-	horizontal line
ACS_VLINE		vertical line
ACS_PLUS	+	plus
ACS_S1	-	scan line 1
ACS_S9	-	scan line 9
ACS_DIAMOND	+	diamond
ACS_CKBOARD	:	checker board (stipple)
ACS_DEGREE	'	degree symbol
ACS_PLMINUS	#	plus/minus
ACS_BULLET	o	bullet
ACS_LARROW	<	arrow pointing left
ACS_RARRROW	>	arrow pointing right
ACS_DARROW	v	arrow pointing down
ACS_UARROW	^	arrow pointing up
ACS_BOARD	#	board of squares
ACS_LANTERN	#	lantern symbol
ACS_BLOCK	#	solid square block

RETURN VALUE

All routines return the integer `ERR` upon failure and an integer value other than `ERR` upon successful completion, unless otherwise noted in the preceding routine descriptions.

`curs_addwch(3CURSES)`

ATTRIBUTES See `attributes(5)` for descriptions of the following attributes:

ATTRIBUTE TYPE	ATTRIBUTE VALUE
MT-Level	Unsafe

SEE ALSO `putwchar(3C)`, `clrtoeol(3CURSES)`, `curses(3CURSES)`, `curs_attr(3CURSES)`, `curs_inwch(3CURSES)`, `curs_outopts(3CURSES)`, `refresh(3CURSES)`, `standout(3CURSES)`, `winwch(3CURSES)`, `wrefresh(3CURSES)`, `attributes(5)`

NOTES The header file `<curses.h>` automatically includes the header files `<stdio.h>`, `<unctrl.h>` and `<widec.h>`.

Note that `addwch()`, `mvaddwch()`, `mvwaddwch()`, and `echowchar()` may be macros.

None of these routines can use the color attribute in `chtype`.

curs_addwchstr(3CURSES)

NAME	curs_addwchstr, addwchstr, addwchnstr, waddwchstr, waddwchnstr, mvaddwchstr, mvaddwchnstr, mvwaddwchstr, mvwaddwchnstr – add string of wchar_t characters (and attributes) to a curses window				
SYNOPSIS	<pre> cc [flag...] file... -lcurses [library...] #include<curses.h> int addwchstr (chtype *wchstr) ; int addwchnstr (chtype *wchstr, int n) ; int waddwchstr (WINDOW *win, chtype *wchstr) ; int waddwchnstr (WINDOW *win, chtype *wchstr, int n) ; int mvaddwchstr (int y, int x, chtype *wchstr) ; int mvaddwchnstr (int y, int x, chtype *wchstr, int n) ; int mvwaddwchstr (WINDOW *win, int y, int x, chtype *wchstr) ; int mvwaddwchnstr (WINDOW *win, int y, int x, chtype *wchstr, int n) ; </pre>				
DESCRIPTION	<p>All of these routines copy <i>wchstr</i>, which points to a string of wchar_t characters, directly into the window image structure starting at the current cursor position. The four routines with <i>n</i> as the last argument copy at most <i>n</i> elements, but no more than will fit on the line. If <i>n</i>==-1 then the whole string is copied, to the maximum number that fit on the line.</p> <p>The position of the window cursor is not advanced. These routines work faster than waddnwstr(3CURSES) because they merely copy <i>wchstr</i> into the window image structure. On the other hand, care must be taken when using these functions because they don't perform any kind of checking (such as for the newline character), they do not advance the current cursor position, and they truncate the string, rather than wrapping it around to the new line.</p>				
RETURN VALUE	All routines return the integer ERR upon failure and an integer value other than ERR upon successful completion, unless otherwise noted in the preceding routine descriptions.				
ATTRIBUTES	See attributes(5) for descriptions of the following attributes:				
	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">ATTRIBUTE TYPE</th> <th style="text-align: center;">ATTRIBUTE VALUE</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">MT-Level</td> <td style="text-align: center;">Unsafe</td> </tr> </tbody> </table>	ATTRIBUTE TYPE	ATTRIBUTE VALUE	MT-Level	Unsafe
ATTRIBUTE TYPE	ATTRIBUTE VALUE				
MT-Level	Unsafe				
SEE ALSO	curses(3CURSES), waddnwstr(3CURSES), attributes(5)				
NOTES	The header file <curses.h> automatically includes the header files <stdio.h>, <unctrl.h> and <widec.h>.				

`curs_addwchstr(3CURSES)`

Note that all routines except `waddwchnstr()` may be macros.

None of these routines can use the color attribute in `chtype`.

curs_addwstr(3CURSES)

NAME	<code>curs_addwstr</code> , <code>addwstr</code> , <code>addnwstr</code> , <code>waddwstr</code> , <code>waddnwstr</code> , <code>mvaddwstr</code> , <code>mvaddnwstr</code> , <code>mvwaddwstr</code> , <code>mvwaddnwstr</code> – add a string of <code>wchar_t</code> characters to a curses window and advance cursor				
SYNOPSIS	<pre>cc [flag...] file... -lcurses [library...] #include<curses.h> int addwstr(wchar_t *wstr); int addnwstr(wchar_t *wstr, int n); int waddwstr(WINDOW *win, wchar_t *wstr); int waddnwstr(WINDOW *win, wchar_t *wstr, int n); int mvaddwstr(int y, int x, wchar_t *wstr); int mvaddnwstr(int y, int x, wchar_t *wstr, int n); int mvwaddwstr(WINDOW *win, int y, int x, wchar_t *wstr); int mvwaddnwstr(WINDOW *win, int y, int x, wchar_t *wstr, int n);</pre>				
DESCRIPTION	All of these routines write all the characters of the null-terminated <code>wchar_t</code> character string <code>wstr</code> on the given window. The effect is similar to calling <code>waddwch(3CURSES)</code> once for each <code>wchar_t</code> character in the string. The four routines with <code>n</code> as the last argument write at most <code>n</code> <code>wchar_t</code> characters. If <code>n</code> is negative, then the entire string will be added.				
RETURN VALUE	All routines return the integer <code>ERR</code> upon failure and an integer value other than <code>ERR</code> upon successful completion.				
ATTRIBUTES	See <code>attributes(5)</code> for descriptions of the following attributes: <table border="1"><thead><tr><th>ATTRIBUTE TYPE</th><th>ATTRIBUTE VALUE</th></tr></thead><tbody><tr><td>MT-Level</td><td>Unsafe</td></tr></tbody></table>	ATTRIBUTE TYPE	ATTRIBUTE VALUE	MT-Level	Unsafe
ATTRIBUTE TYPE	ATTRIBUTE VALUE				
MT-Level	Unsafe				
SEE ALSO	<code>curses(3CURSES)</code> , <code>waddwch(3CURSES)</code> , <code>attributes(5)</code>				
NOTES	The header file <code><curses.h></code> automatically includes the header files <code><stdio.h></code> , <code><nctrl.h></code> and <code><widec.h></code> . Note that all of these routines except <code>waddwstr()</code> and <code>waddnwstr()</code> may be macros.				

NAME curs_alecompat, movenextch, wmovenextch, moveprevch, wmoveprevch, adjcurspos, wadjcurspos – these functions are added to ALE curses library for moving the cursor by character.

SYNOPSIS

```
cc [ flag ... ] file ... -lcurses [ library .. ]
#include <curses.h>

int movenextch(void);
int wmovenextch(WINDOW *win);
int moveprevch(void);
int wmoveprevch(WINDOW *win);
int adjcurspos(void);
int wadjcurspos(WINDOW *win);
```

DESCRIPTION

movenextch() and wmovenextch() move the cursor to the next character to the right. If the next character is a multicolumn character, the cursor is positioned on the first (left-most) column of that character. The new cursor position will be on the next character, even if the cursor was originally positioned on the left-most column of a multicolumn character. Note that the simple cursor increment (++x) does not guarantee movement to the next character, if the cursor was originally positioned on a multicolumn character. getyx(3CURSES) can be used to find the new position.

moveprevch() and wmoveprevch() routines are the opposite of movenextch() and wmovenextch(), moving the cursor to the left-most column of the previous character.

adjcurspos() and wadjcurspos() move the cursor to the first(left-most) column of the multicolumn character that the cursor is presently on. If the cursor is already on the first column, or if the cursor is on a single-column character, these routines will have no effect.

RETURN VALUE All routines return the integer ERR upon failure and an integer value other than ERR upon successful completion.

ATTRIBUTES See attributes(5) for descriptions of the following attributes:

ATTRIBUTE TYPE	ATTRIBUTE VALUE
MT-Level	Unsafe

SEE ALSO curses(3CURSES), getyx(3CURSES), attributes(5)

NOTES The header file <curses.h> automatically includes the header files <stdio.h>, <unctrl.h> and <widec.h>.

Note that movenextch(), moveprevch(), and adjcurspos() may be macros.

curs_attr(3CURSES)

NAME	curs_attr, attroff, wattroff, attron, wattroff, attrset, wattrset, standend, wstandend, standout, wstandout – curses character and window attribute control routines														
SYNOPSIS	<pre>cc [flag ...] file ... -lcurses [library ...] #include <curses.h> int attroff(int attrs); int wattroff(WINDOW *win, int attrs); int attron(int attrs); int wattroff(WINDOW *win, int attrs); int attrset(int attrs); int wattrset(WINDOW *win, int attrs); int standend(void); int wstandend(WINDOW *win); int standout(void); int wstandout(WINDOW *win);</pre>														
DESCRIPTION	<p>All of these routines manipulate the current attributes of the named window. The current attributes of a window are applied to all characters that are written into the window with <code>waddch()</code>, <code>waddstr()</code>, and <code>wprintw()</code>. Attributes are a property of the character, and move with the character through any scrolling and insert/delete line/character operations. To the extent possible on the particular terminal, they are displayed as the graphic rendition of characters put on the screen.</p> <p>The routine <code>attrset()</code> sets the current attributes of the given window to <code>attrs</code>. The routine <code>attroff()</code> turns off the named attributes without turning any other attributes on or off. The routine <code>attron()</code> turns on the named attributes without affecting any others. The routine <code>standout()</code> is the same as <code>attron(A_STANDOUT)</code>. The routine <code>standend()</code> is the same as <code>attroff()</code>, that is, it turns off all attributes.</p>														
Attributes	<p>The following video attributes, defined in <code><curses.h></code>, can be passed to the routines <code>attron()</code>, <code>attroff()</code>, and <code>attrset()</code>, or OR-ed with the characters passed to <code>addch()</code>.</p> <table><tr><td>A_STANDOUT</td><td>Best highlighting mode of the terminal</td></tr><tr><td>A_UNDERLINE</td><td>Underlining</td></tr><tr><td>A_REVERSE</td><td>Reverse video</td></tr><tr><td>A_BLINK</td><td>Blinking</td></tr><tr><td>A_DIM</td><td>Half bright</td></tr><tr><td>A_BOLD</td><td>Extra bright or bold</td></tr><tr><td>A_ALTCHARSET</td><td>Alternate character set</td></tr></table>	A_STANDOUT	Best highlighting mode of the terminal	A_UNDERLINE	Underlining	A_REVERSE	Reverse video	A_BLINK	Blinking	A_DIM	Half bright	A_BOLD	Extra bright or bold	A_ALTCHARSET	Alternate character set
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A_ALTCHARSET	Alternate character set														

curs_attr(3CURSES)

A_CHARTEXT Bit-mask to extract a character

COLOR_PAIR(*n*) Color-pair number *n*

The following macro is the reverse of COLOR_PAIR(*n*) :

PAIR_NUMBER(*attrs*) Returns the pair number associated with the
 COLOR_PAIR(*n*) attribute

RETURN VALUES These routines always return 1.

ATTRIBUTES See attributes(5) for descriptions of the following attributes:

ATTRIBUTE TYPE	ATTRIBUTE VALUE
MT-Level	Unsafe

SEE ALSO curs_addch(3CURSES), curs_addstr(3CURSES), curs_printw(3CURSES),
 curses(3CURSES), attributes(5)

NOTES The header <curses.h> automatically includes the headers <stdio.h> and
 <unctrl.h>.

Note that attroff(), wattroff(), attron(), wattron(), wattrset(),
 standend(), and standout() may be macros.

curs_beep(3CURSES)

NAME	curs_beep, beep, flash – curses bell and screen flash routines				
SYNOPSIS	<pre>cc [flag ...] file ... -lcurses [library ...] #include <curses.h> int beep(void); int flash(void);</pre>				
DESCRIPTION	The <code>beep()</code> and <code>flash()</code> routines are used to signal the terminal user. The routine <code>beep()</code> sounds the audible alarm on the terminal, if possible; if that is not possible, it flashes the screen (visible bell), if that is possible. The routine <code>flash()</code> flashes the screen, and if that is not possible, sounds the audible signal. If neither signal is possible, nothing happens. Nearly all terminals have an audible signal (bell or beep), but only some can flash the screen.				
RETURN VALUES	These routines always return OK.				
ATTRIBUTES	See <code>attributes(5)</code> for descriptions of the following attributes:				
	<table border="1"><thead><tr><th>ATTRIBUTE TYPE</th><th>ATTRIBUTE VALUE</th></tr></thead><tbody><tr><td>MT-Level</td><td>Unsafe</td></tr></tbody></table>	ATTRIBUTE TYPE	ATTRIBUTE VALUE	MT-Level	Unsafe
ATTRIBUTE TYPE	ATTRIBUTE VALUE				
MT-Level	Unsafe				
SEE ALSO	<code>curses(3CURSES)</code> , <code>attributes(5)</code>				
NOTES	The header <code><curses.h></code> automatically includes the headers <code><stdio.h></code> and <code><unctrl.h></code> .				

NAME | curs_bkgd, bkgd, bkgdset, wbkgdset, wbkgd – curses window background manipulation routines

SYNOPSIS |

```
cc [ flag ... ] file ... -lcurses [ library ... ]
#include <curses.h>

int bkgd(chtype ch);
void bkgdset(chtype ch);
void wbkgdset(WINDOW *win, chtype ch);
int wbkgd(WINDOW *win, chtype ch);
```

DESCRIPTION |

The bkgdsets() and wbkgdset() routines manipulate the background of the named window. Background is a chtype consisting of any combination of attributes and a character. The attribute part of the background is combined (ORed) with all non-blank characters that are written into the window with waddch(). Both the character and attribute parts of the background are combined with the blank characters. The background becomes a property of the character and moves with the character through any scrolling and insert/delete line/character operations. To the extent possible on a particular terminal, the attribute part of the background is displayed as the graphic rendition of the character put on the screen.

The bkgd() and wbkgd() routines combine the new background with every position in the window. Background is any combination of attributes and a character. Only the attribute part is used to set the background of non-blank characters, while both character and attributes are used for blank positions. To the extent possible on a particular terminal, the attribute part of the background is displayed as the graphic rendition of the character put on the screen.

RETURN VALUES | bkgd() and wbkgd() return the integer OK, or a non-negative integer, if immedok() is set. See curs_ouptops(3CURSES).

ATTRIBUTES | See attributes(5) for descriptions of the following attributes:

ATTRIBUTE TYPE	ATTRIBUTE VALUE
MT-Level	Unsafe

SEE ALSO | curs_addch(3CURSES), curs_ouptops(3CURSES), curses(3CURSES), attributes(5)

NOTES | The header <curses.h> automatically includes the headers <stdio.h> and <unctrl.h>.

Note that bkgdset() and bkgd() may be macros.

curs_border(3CURSES)

NAME	curs_border, border, wborder, box, whline, wvline – create curses borders, horizontal and vertical lines																
SYNOPSIS	<pre>cc [flag ...] file ... -lcurses [library ...] #include <curses.h> int border(chtype <i>ls</i>, chtype <i>rs</i>, chtype <i>ts</i>, chtype <i>bs</i>, chtype <i>tl</i>, chtype <i>tr</i>, chtype <i>bl</i>, chtype <i>br</i>); int wborder(WINDOW *<i>win</i>, chtype <i>ls</i>, chtype <i>rs</i>, chtype <i>ts</i>, chtype <i>bs</i>, chtype <i>tl</i>, chtype <i>tr</i>, chtype <i>bl</i>, chtype <i>br</i>); int box(WINDOW *<i>win</i>, chtype <i>verch</i>, chtype <i>horch</i>); int hline(chtype <i>ch</i>, int <i>n</i>); int whline(WINDOW *<i>win</i>, chtype <i>ch</i>, int <i>n</i>); int vline(chtype <i>ch</i>, int <i>n</i>); int wvline(WINDOW *<i>win</i>, chtype <i>ch</i>, int <i>n</i>);</pre>																
DESCRIPTION	<p>With the <code>border()</code>, <code>wborder()</code>, and <code>box()</code> routines, a border is drawn around the edges of the window. The arguments and attributes are:</p> <hr/> <table><tr><td><i>ls</i></td><td>left side of the border</td></tr><tr><td><i>rs</i></td><td>right side of the border</td></tr><tr><td><i>ts</i></td><td>top side of the border</td></tr><tr><td><i>bs</i></td><td>bottom side of the border</td></tr><tr><td><i>tl</i></td><td>top left-hand corner</td></tr><tr><td><i>tr</i></td><td>top right-hand corner</td></tr><tr><td><i>bl</i></td><td>bottom left-hand corner</td></tr><tr><td><i>br</i></td><td>bottom right-hand corner</td></tr></table> <hr/> <p>If any of these arguments is zero, then the following default values (defined in <code><curses.h></code>) are used respectively instead: <code>ACS_VLINE</code>, <code>ACS_VLINE</code>, <code>ACS_HLINE</code>, <code>ACS_HLINE</code>, <code>ACS_ULCORNER</code>, <code>ACS_URCORNER</code>, <code>ACS_BLCORNER</code>, <code>ACS_BRCORNER</code>.</p> <p><code>box(<i>win</i>, <i>verch</i>, <i>horch</i>)</code> is a shorthand for the following call:</p> <pre>wborder(<i>win</i>, <i>verch</i>, <i>verch</i>, <i>horch</i>, <i>horch</i>, 0, 0, 0, 0)</pre> <p><code>hline()</code> and <code>whline()</code> draw a horizontal (left to right) line using <i>ch</i> starting at the current cursor position in the window. The current cursor position is not changed. The line is at most <i>n</i> characters long, or as many as fit into the window.</p>	<i>ls</i>	left side of the border	<i>rs</i>	right side of the border	<i>ts</i>	top side of the border	<i>bs</i>	bottom side of the border	<i>tl</i>	top left-hand corner	<i>tr</i>	top right-hand corner	<i>bl</i>	bottom left-hand corner	<i>br</i>	bottom right-hand corner
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<i>bl</i>	bottom left-hand corner																
<i>br</i>	bottom right-hand corner																

`curs_border(3CURSES)`

`vline()` and `wvline()` draw a vertical (top to bottom) line using `ch` starting at the current cursor position in the window. The current cursor position is not changed. The line is at most *n* characters long, or as many as fit into the window.

RETURN VALUES All routines return the integer `OK`, or a non-negative integer if `immedok()` is set. See `curs_outopts(3CURSES)`.

ATTRIBUTES See `attributes(5)` for descriptions of the following attributes:

ATTRIBUTE TYPE	ATTRIBUTE VALUE
MT-Level	Unsafe

SEE ALSO `curs_outopts(3CURSES)`, `curses(3CURSES)`, `attributes(5)`

NOTES The header `<curses.h>` automatically includes the headers `<stdio.h>` and `<unctrl.h>`.

Note that `border()` and `box()` may be macros.

curs_clear(3CURSES)

NAME	curs_clear, erase, werase, clear, wclear, clrtoebot, wclrtoebot, clrtoeol, wclrtoeol – clear all or part of a curses window				
SYNOPSIS	<pre>cc [flag...] file ... -lcurses [library ...] #include <curses.h> int erase(void); int werase(WINDOW *win); int clear(void); int wclear(WINDOW *win); int clrtoebot(void); int wclrtoebot(WINDOW *win); int clrtoeol(void); int wclrtoeol(WINDOW *win);</pre>				
DESCRIPTION	<p>The erase() and werase() routines copy blanks to every position in the window.</p> <p>The clear() and wclear() routines are like erase() and werase(), but they also call clearok(), so that the screen is cleared completely on the next call to wrefresh() for that window and repainted from scratch.</p> <p>The clrtoebot() and wclrtoebot() routines erase all lines below the cursor in the window. Also, the current line to the right of the cursor, inclusive, is erased.</p> <p>The clrtoeol() and wclrtoeol() routines erase the current line to the right of the cursor, inclusive.</p>				
RETURN VALUES	All routines return the integer OK, or a non-negative integer if immedok() is set. See curs_ouptos(3CURSES).				
ATTRIBUTES	See attributes(5) for descriptions of the following attributes:				
	<table border="1"><thead><tr><th>ATTRIBUTE TYPE</th><th>ATTRIBUTE VALUE</th></tr></thead><tbody><tr><td>MT-Level</td><td>Unsafe</td></tr></tbody></table>	ATTRIBUTE TYPE	ATTRIBUTE VALUE	MT-Level	Unsafe
ATTRIBUTE TYPE	ATTRIBUTE VALUE				
MT-Level	Unsafe				
SEE ALSO	curs_ouptos(3CURSES), curs_refresh(3CURSES), curses(3CURSES), attributes(5)				
NOTES	<p>The header <curses.h> automatically includes the headers <stdio.h> and <unctrl.h>.</p> <p>Note that erase(), werase(), clear(), wclear(), clrtoebot(), and clrtoeol() may be macros.</p>				

NAME	curs_color, start_color, init_pair, init_color, has_colors, can_change_color, color_content, pair_content – curses color manipulation routines
SYNOPSIS	<pre>cc [flag ...] file ... -lcurses [library ...] #include <curses.h> int start_color(void); int init_pair(short pair, short fg, short bg); int init_color(short color, short red, short green, short blue); bool has_colors(void); bool can_change_color(void); int color_content(short color, short *redp, short *greenp, short *bluep); int pair_content(short pair, short *fgp, short *bgp);</pre>
DESCRIPTION	
Overview	<p>curses provides routines that manipulate color on color alphanumeric terminals. To use these routines <code>start_color()</code> must be called, usually right after <code>initscr()</code>. See <code>curs_initscr(3CURSES)</code>. Colors are always used in pairs (referred to as color-pairs). A color-pair consists of a foreground color (for characters) and a background color (for the field on which the characters are displayed). A programmer initializes a color-pair with the routine <code>init_pair</code>. After it has been initialized, <code>COLOR_PAIR(n)</code>, a macro defined in <code><curses.h></code>, can be used in the same ways other video attributes can be used. If a terminal is capable of redefining colors, the programmer can use the routine <code>init_color()</code> to change the definition of a color. The routines <code>has_colors()</code> and <code>can_change_color()</code> return <code>TRUE</code> or <code>FALSE</code>, depending on whether the terminal has color capabilities and whether the programmer can change the colors. The routine <code>color_content()</code> allows a programmer to identify the amounts of red, green, and blue components in an initialized color. The routine <code>pair_content()</code> allows a programmer to find out how a given color-pair is currently defined.</p>
Routine Descriptions	<p>The <code>start_color()</code> routine requires no arguments. It must be called if the programmer wants to use colors, and before any other color manipulation routine is called. It is good practice to call this routine right after <code>initscr()</code>. <code>start_color()</code> initializes eight basic colors (black, red, green, yellow, blue, magenta, cyan, and white), and two global variables, <code>COLORS</code> and <code>COLOR_PAIRS</code> (respectively defining the maximum number of colors and color-pairs the terminal can support). It also restores the colors on the terminal to the values they had when the terminal was just turned on.</p> <p>The <code>init_pair()</code> routine changes the definition of a color-pair. It takes three arguments: the number of the color-pair to be changed, the foreground color number, and the background color number. The value of the first argument must be between 1</p>

curs_color(3CURSES)

and `COLOR_PAIRS-1`. The value of the second and third arguments must be between 0 and `COLORS`. If the color-pair was previously initialized, the screen is refreshed and all occurrences of that color-pair is changed to the new definition.

The `init_color()` routine changes the definition of a color. It takes four arguments: the number of the color to be changed followed by three RGB values (for the amounts of red, green, and blue components). The value of the first argument must be between 0 and `COLORS`. (See the section `Colors` for the default color index.) Each of the last three arguments must be a value between 0 and 1000. When `init_color()` is used, all occurrences of that color on the screen immediately change to the new definition.

The `has_colors()` routine requires no arguments. It returns `TRUE` if the terminal can manipulate colors; otherwise, it returns `FALSE`. This routine facilitates writing terminal-independent programs. For example, a programmer can use it to decide whether to use color or some other video attribute.

The `can_change_color()` routine requires no arguments. It returns `TRUE` if the terminal supports colors and can change their definitions; other, it returns `FALSE`. This routine facilitates writing terminal-independent programs.

The `color_content()` routine gives users a way to find the intensity of the red, green, and blue (RGB) components in a color. It requires four arguments: the color number, and three addresses of `shorts` for storing the information about the amounts of red, green, and blue components in the given color. The value of the first argument must be between 0 and `COLORS`. The values that are stored at the addresses pointed to by the last three arguments are between 0 (no component) and 1000 (maximum amount of component).

The `pair_content()` routine allows users to find out what colors a given color-pair consists of. It requires three arguments: the color-pair number, and two addresses of `shorts` for storing the foreground and the background color numbers. The value of the first argument must be between 1 and `COLOR_PAIRS-1`. The values that are stored at the addresses pointed to by the second and third arguments are between 0 and `COLORS`.

Colors In `<curses.h>` the following macros are defined. These are the default colors. `curses` also assumes that `COLOR_BLACK` is the default background color for all terminals.

```
COLOR_BLACK
COLOR_RED
COLOR_GREEN
COLOR_YELLOW
COLOR_BLUE
COLOR_MAGENTA
COLOR_CYAN
COLOR_WHITE
```

RETURN VALUES All routines that return an integer return `ERR` upon failure and `OK` upon successful completion.

`curs_color(3CURSES)`

ATTRIBUTES See `attributes(5)` for descriptions of the following attributes:

ATTRIBUTE TYPE	ATTRIBUTE VALUE
MT-Level	Unsafe

SEE ALSO `curs_attr(3CURSES)`, `curs_initscr(3CURSES)`, `curses(3CURSES)`, `attributes(5)`

NOTES The header `<curses.h>` automatically includes the headers `<stdio.h>` and `<unctrl.h>`.

curscr(3XCURSES)

- NAME** curscr – current window
- SYNOPSIS**

```
cc [ flag... ] file... -I /usr/xpg4/include -L /usr/xpg4/lib \
-R /usr/xpg4/lib -lcurses [ library... ]

c89 [ flag... ] file... -lcurses [ library... ]

#include <curses.h>

extern WINDOW *curscr;
```
- DESCRIPTION** The external variable `curscr` points to an internal data structure. It can be specified as an argument to certain functions such as `clearok(3XCURSES)`.
- ATTRIBUTES** See `attributes(5)` for descriptions of the following attributes:

ATTRIBUTE TYPE	ATTRIBUTE VALUE
Interface Stability	Standard
MT-Level	Unsafe

- SEE ALSO** `clearok(3XCURSES)`, `libcurses(3XCURSES)`, `attributes(5)`, `standards(5)`

NAME curs_delch, delch, wdelch, mvdelch, mvwdelch – delete character under cursor in a curses window

SYNOPSIS

```
cc [ flag ... ] file ... -lcurses [ library ... ]
#include <curses.h>

int delch(void);
int wdelch(WINDOW *win);
int mvdelch(int y, int x);
int mvwdelch(WINDOW *win, int y, int x);
```

DESCRIPTION With these routines the character under the cursor in the window is deleted; all characters to the right of the cursor on the same line are moved to the left one position and the last character on the line is filled with a blank. The cursor position does not change (after moving to *y, x*, if specified). This does not imply use of the hardware delete character feature.

RETURN VALUES All routines return the integer ERR upon failure and an integer value other than ERR upon successful completion.

ATTRIBUTES See attributes(5) for descriptions of the following attributes:

ATTRIBUTE TYPE	ATTRIBUTE VALUE
MT-Level	Unsafe

SEE ALSO curses(3CURSES), attributes(5)

NOTES The header `<curses.h>` automatically includes the headers `<stdio.h>` and `<unctrl.h>`.

Note that `delch()`, `mvdelch()`, and `mvwdelch()` may be macros.

curs_deleteln(3CURSES)

NAME	curs_deleteln, deleteln, wdeleteln, insdelln, winsdelln, insertln, winsertln – delete and insert lines in a curses window				
SYNOPSIS	<pre>cc [flag ...] file ... -lcurses [library ...] #include <curses.h> int deleteln(void); int wdeleteln(WINDOW *win); int insdelln(int n); int winsdelln(WINDOW *win, int n); int insertln(void); int winsertln(WINDOW *win);</pre>				
DESCRIPTION	<p>With the <code>deleteln()</code> and <code>wdeleteln()</code> routines, the line under the cursor in the window is deleted; all lines below the current line are moved up one line. The bottom line of the window is cleared. The cursor position does not change. This does not imply use of a hardware delete line feature.</p> <p>With the <code>insdelln()</code> and <code>winsdelln()</code> routines, for positive <i>n</i>, insert <i>n</i> lines into the specified window above the current line. The <i>n</i> bottom lines are lost. For negative <i>n</i>, delete <i>n</i> lines (starting with the one under the cursor), and move the remaining lines up. The bottom <i>n</i> lines are cleared. The current cursor position remains the same.</p> <p>With the <code>insertln()</code> and <code>winsertln()</code> routines, a blank line is inserted above the current line and the bottom line is lost. This does not imply use of a hardware insert line feature.</p>				
RETURN VALUES	All routines return the integer <code>ERR</code> upon failure and an integer value other than <code>ERR</code> upon successful completion.				
ATTRIBUTES	See <code>attributes(5)</code> for descriptions of the following attributes:				
	<table border="1"><thead><tr><th>ATTRIBUTE TYPE</th><th>ATTRIBUTE VALUE</th></tr></thead><tbody><tr><td>MT-Level</td><td>Unsafe</td></tr></tbody></table>	ATTRIBUTE TYPE	ATTRIBUTE VALUE	MT-Level	Unsafe
ATTRIBUTE TYPE	ATTRIBUTE VALUE				
MT-Level	Unsafe				
SEE ALSO	<code>curses(3CURSES)</code> , <code>attributes(5)</code>				
NOTES	<p>The header <code><curses.h></code> automatically includes the headers <code><stdio.h></code> and <code><unctrl.h></code>.</p> <p>Note that all but <code>winsdelln()</code> may be macros.</p>				

NAME	curses – CRT screen handling and optimization package
SYNOPSIS	<pre>cc [<i>flag...</i>] <i>file...</i> -lcurses [<i>library...</i>] #include <curses.h></pre>
DESCRIPTION	<p>The curses library routines give the user a terminal-independent method of updating character screens with reasonable optimization.</p> <p>The curses package allows: overall screen, window and pad manipulation; output to windows and pads; reading terminal input; control over terminal and curses input and output options; environment query routines; color manipulation; use of soft label keys; terminfo access; and access to low-level curses routines.</p> <p>To initialize the routines, the routine <code>initscr()</code> or <code>newterm()</code> must be called before any of the other routines that deal with windows and screens are used. The routine <code>endwin()</code> must be called before exiting. To get character-at-a-time input without echoing (most interactive, screen oriented programs want this), the following sequence should be used:</p> <pre>initscr,cbreak,noecho;</pre> <p>Most programs would additionally use the sequence:</p> <pre>nonl,intrflush(stdscr,FALSE),keypad(stdscr,TRUE);</pre> <p>Before a curses program is run, the tab stops of the terminal should be set and its initialization strings, if defined, must be output. This can be done by executing the <code>tput init</code> command after the shell environment variable <code>TERM</code> has been exported. (See <code>terminfo(4)</code> for further details.)</p> <p>The curses library permits manipulation of data structures, called <i>windows</i>, which can be thought of as two-dimensional arrays of characters representing all or part of a CRT screen. A default window called <code>stdscr</code>, which is the size of the terminal screen, is supplied. Others may be created with <code>newwin(3CURSES)</code>.</p> <p>Windows are referred to by variables declared as <code>WINDOW *</code>. These data structures are manipulated with routines described on 3CURSES pages (whose names begin "curs_"). Among which the most basic routines are <code>move(3CURSES)</code> and <code>addch(3CURSES)</code>. More general versions of these routines are included with names beginning with <code>w</code>, allowing the user to specify a window. The routines not beginning with <code>w</code> affect <code>stdscr</code>.</p> <p>After using routines to manipulate a window, <code>refresh(3CURSES)</code> is called, telling curses to make the user's CRT screen look like <code>stdscr</code>. The characters in a window are actually of type <code>chtype</code>, (character and attribute data) so that other information about the character may also be stored with each character.</p>

curses(3CURSES)

Special windows called *pads* may also be manipulated. These are windows which are not constrained to the size of the screen and whose contents need not be completely displayed. See `curs_pad(3CURSES)` for more information.

In addition to drawing characters on the screen, video attributes and colors may be included, causing the characters to show up in such modes as underlined, in reverse video, or in color on terminals that support such display enhancements. Line drawing characters may be specified to be output. On input, `curses` is also able to translate arrow and function keys that transmit escape sequences into single values. The video attributes, line drawing characters, and input values use names, defined in `<curses.h>`, such as `A_REVERSE`, `ACS_HLINE`, and `KEY_LEFT`.

If the environment variables `LINES` and `COLUMNS` are set, or if the program is executing in a window environment, line and column information in the environment will override information read by `terminfo`. This would effect a program running in an AT&T 630 layer, for example, where the size of a screen is changeable.

If the environment variable `TERMINFO` is defined, any program using `curses` checks for a local terminal definition before checking in the standard place. For example, if `TERM` is set to `att4424`, then the compiled terminal definition is found in

```
/usr/share/lib/terminfo/a/att4424.
```

(The 'a' is copied from the first letter of `att4424` to avoid creation of huge directories.) However, if `TERMINFO` is set to `$HOME/myterms`, `curses` first checks

```
$HOME/myterms/a/att4424,
```

and if that fails, it then checks

```
/usr/share/lib/terminfo/a/att4424.
```

This is useful for developing experimental definitions or when write permission in `/usr/share/lib/terminfo` is not available.

The integer variables `LINES` and `COLS` are defined in `<curses.h>` and will be filled in by `initscr` with the size of the screen. The constants `TRUE` and `FALSE` have the values 1 and 0, respectively.

The `curses` routines also define the WINDOW * variable `curscr` which is used for certain low-level operations like clearing and redrawing a screen containing garbage. The `curscr` can be used in only a few routines.

International Functions

The number of bytes and the number of columns to hold a character from the supplementary character set is locale-specific (locale category `LC_CTYPE`) and can be specified in the character class table.

For editing, operating at the character level is entirely appropriate. For screen formatting, arbitrary movement of characters on screen is not desirable.

Overwriting characters (`addch`, for example) operates on a screen level. Overwriting a character by a character that requires a different number of columns may produce *orphaned columns*. These orphaned columns are filled with background characters.

Inserting characters (`insch`, for example) operates on a character level (that is, at the character boundaries). The specified character is inserted right before the character, regardless of which column of a character the cursor points to. Before insertion, the cursor position is adjusted to the first column of the character.

As with inserting characters, deleting characters (`delch`, for example) operates on a character level (that is, at the character boundaries). The character at the cursor is deleted whichever column of the character the cursor points to. Before deletion, the cursor position is adjusted to the first column of the character.

A *multi-column* character cannot be put on the last column of a line. When such attempts are made, the last column is set to the background character. In addition, when such an operation creates orphaned columns, the orphaned columns are filled with background characters.

Overlapping and overwriting a window follows the operation of overwriting characters around its edge. The orphaned columns, if any, are handled as in the character operations.

The cursor is allowed to be placed anywhere in a window. If the insertion or deletion is made when the cursor points to the second or later column position of a character that holds multiple columns, the cursor is adjusted to the first column of the character before the insertion or deletion.

Routine and Argument Names

Many `curses` routines have two or more versions. The routines prefixed with `w` require a window argument. The routines prefixed with `p` require a pad argument. Those without a prefix generally use `stdscr`.

The routines prefixed with `mv` require an x and y coordinate to move to before performing the appropriate action. The `mv` routines imply a call to `move(3CURSES)` before the call to the other routine. The coordinate y always refers to the row (of the window), and x always refers to the column. The upper left-hand corner is always (0,0), not (1,1).

The routines prefixed with `mvw` take both a window argument and x and y coordinates. The window argument is always specified before the coordinates.

In each case, *win* is the window affected, and *pad* is the pad affected; *win* and *pad* are always pointers to type `WINDOW`

curses(3CURSES)

Option setting routines require a Boolean flag *bf* with the value TRUE or FALSE; *bf* is always of type `bool`. The variables *ch* and *attrs* below are always of type `chtype`. The types `WINDOW`, `SCREEN`, `bool`, and `chtype` are defined in `<curses.h>`. The type `TERMINAL` is defined in `<term.h>`. All other arguments are integers.

**Routine Name
Index**

The following table lists each `curses` routine and the name of the manual page on which it is described.

curses Routine Name	Manual Page Name
<code>addch</code>	<code>curs_addch(3CURSES)</code>
<code>addchnstr</code>	<code>curs_addchstr(3CURSES)</code>
<code>addchstr</code>	<code>curs_addchstr(3CURSES)</code>
<code>addnstr</code>	<code>curs_addstr(3CURSES)</code>
<code>addnwstr</code>	<code>curs_addwstr(3CURSES)</code>
<code>addstr</code>	<code>curs_addstr(3CURSES)</code>
<code>addwch</code>	<code>curs_addwch(3CURSES)</code>
<code>addwchnstr</code>	<code>curs_addwchstr(3CURSES)</code>
<code>addwchstr</code>	<code>curs_addwchstr(3CURSES)</code>
<code>addwstr</code>	<code>curs_addwstr(3CURSES)</code>
<code>adjcurspos</code>	<code>curs_alecompat(3CURSES)</code>
<code>attroff</code>	<code>curs_attr(3CURSES)</code>
<code>attron</code>	<code>curs_attr(3CURSES)</code>
<code>attrset</code>	<code>curs_attr(3CURSES)</code>
<code>baudrate</code>	<code>curs_termattrs(3CURSES)</code>
<code>beep</code>	<code>curs_beep(3CURSES)</code>
<code>bkgd</code>	<code>curs_bkgd(3CURSES)</code>
<code>bkgdset</code>	<code>curs_bkgd(3CURSES)</code>
<code>border</code>	<code>curs_border(3CURSES)</code>
<code>box</code>	<code>curs_border(3CURSES)</code>
<code>can_change_color</code>	<code>curs_color(3CURSES)</code>
<code>cbreak</code>	<code>curs_inopts(3CURSES)</code>
<code>clear</code>	<code>curs_clear(3CURSES)</code>
<code>clearok</code>	<code>curs_outopts(3CURSES)</code>
<code>clrtoBot</code>	<code>curs_clear(3CURSES)</code>

clrtoeol	curs_clear(3CURSES)
color_content	curs_color(3CURSES)
copywin	curs_overlay(3CURSES)
curs_set	curs_kernel(3CURSES)
def_prog_mode	curs_kernel(3CURSES)
def_shell_mode	curs_kernel(3CURSES)
del_curterm	curs_terminfo(3CURSES)
delay_output	curs_util(3CURSES)
delch	curs_delch(3CURSES)
deleteln	curs_deleteln(3CURSES)
delscreen	curs_initscr(3CURSES)
delwin	curs_window(3CURSES)
derwin	curs_window(3CURSES)
doupdate	curs_refresh(3CURSES)
dupwin	curs_window(3CURSES)
echo	curs_inopts(3CURSES)
echochar	curs_addch(3CURSES)
echowchar	curs_addwch(3CURSES)
endwin	curs_initscr(3CURSES)
erase	curs_clear(3CURSES)
erasechar	curs_termattrs(3CURSES)
filter	curs_util(3CURSES)
flash	curs_beep(3CURSES)
flushinp	curs_util(3CURSES)
getbegyx	curs_getyx(3CURSES)
getch	curs_getch(3CURSES)
getmaxyx	curs_getyx(3CURSES)
getnwstr	curs_getwstr(3CURSES)
getparyx	curs_getyx(3CURSES)
getstr	curs_getstr(3CURSES)
getsyx	curs_kernel(3CURSES)

curses(3CURSES)

getwch	curs_getwch(3CURSES)
getwin	curs_util(3CURSES)
getwstr	curs_getwstr(3CURSES)
getyx	curs_getyx(3CURSES)
halfdelay	curs_inopts(3CURSES)
has_colors	curs_color(3CURSES)
has_ic	curs_termattrs(3CURSES)
has_il	curs_termattrs(3CURSES)
idcok	curs_outopts(3CURSES)
idlok	curs_outopts(3CURSES)
immedok	curs_outopts(3CURSES)
inch	curs_inch(3CURSES)
inchnstr	curs_inchstr(3CURSES)
inchstr	curs_inchstr(3CURSES)
init_color	curs_color(3CURSES)
init_pair	curs_color(3CURSES)
initscr	curs_initscr(3CURSES)
innstr	curs_instr(3CURSES)
innwstr	curs_inwstr(3CURSES)
insch	curs_insch(3CURSES)
insdelln	curs_deleteln(3CURSES)
insertln	curs_deleteln(3CURSES)
insnstr	curs_insstr(3CURSES)
insnwstr	curs_inswstr(3CURSES)
insstr	curs_insstr(3CURSES)
instr	curs_instr(3CURSES)
inswch	curs_inswch(3CURSES)
inswstr	curs_inswstr(3CURSES)
intrflush	curs_inopts(3CURSES)
inwch	curs_inwch(3CURSES)
inwchnstr	curs_inwchstr(3CURSES)

curses(3CURSES)

inwchstr	curs_inwchstr(3CURSES)
inwstr	curs_inwstr(3CURSES)
is_linetouched	curs_touch(3CURSES)
is_wintouched	curs_touch(3CURSES)
isendwin	curs_initscr(3CURSES)
keyname	curs_util(3CURSES)
keypad	curs_inopts(3CURSES)
killchar	curs_termattrs(3CURSES)
leaveok	curs_outopts(3CURSES)
longname	curs_termattrs(3CURSES)
meta	curs_inopts(3CURSES)
move	curs_move(3CURSES)
movenextch	curs_alecompat(3CURSES)
moveprevch	curs_alecompat(3CURSES)
mvaddch	curs_addch(3CURSES)
mvaddchnstr	curs_addchstr(3CURSES)
mvaddchstr	curs_addchstr(3CURSES)
mvaddnstr	curs_addstr(3CURSES)
mvaddnwstr	curs_addwstr(3CURSES)
mvaddstr	curs_addstr(3CURSES)
mvaddwch	curs_addwch(3CURSES)
mvaddwchnstr	curs_addwchstr(3CURSES)
mvaddwchstr	curs_addwchstr(3CURSES)
mvaddwstr	curs_addwstr(3CURSES)
mvcur	curs_terminfo(3CURSES)
mvdelch	curs_delch(3CURSES)
mvderwin	curs_window(3CURSES)
mvgetch	curs_getch(3CURSES)
mvgetnwstr	curs_getwstr(3CURSES)
mvgetstr	curs_getstr(3CURSES)
mvgetwch	curs_getwch(3CURSES)

curses(3CURSES)

mvgetwstr	curs_getwstr(3CURSES)
mvinch	curs_inch(3CURSES)
mvinchnstr	curs_inchstr(3CURSES)
mvinchstr	curs_inchstr(3CURSES)
mvinnstr	curs_instr(3CURSES)
mvinnwstr	curs_inwstr(3CURSES)
mvinsch	curs_insch(3CURSES)
mvinsnstr	curs_insstr(3CURSES)
mvinswstr	curs_inswstr(3CURSES)
mvinsstr	curs_insstr(3CURSES)
mvinstr	curs_instr(3CURSES)
mvinswch	curs_inswch(3CURSES)
mvinswstr	curs_inswstr(3CURSES)
mvinwch	curs_inwch(3CURSES)
mvinwchnstr	curs_inwchstr(3CURSES)
mvinwchstr	curs_inwchstr(3CURSES)
mvinwstr	curs_inwstr(3CURSES)
mvprintw	curs_printw(3CURSES)
mvscanw	curs_scanw(3CURSES)
mvwaddch	curs_addch(3CURSES)
mvwaddchnstr	curs_addchstr(3CURSES)
mvwaddchstr	curs_addchstr(3CURSES)
mvwaddnstr	curs_addstr(3CURSES)
mvwaddnwstr	curs_addwstr(3CURSES)
mvwaddstr	curs_addstr(3CURSES)
mvwaddwch	curs_addwch(3CURSES)
mvwaddwchnstr	curs_addwchstr(3CURSES)
mvwaddwchstr	curs_addwchstr(3CURSES)
mvwaddwstr	curs_addwstr(3CURSES)
mvwdelch	curs_delch(3CURSES)
mvwgetch	curs_getch(3CURSES)

curses(3CURSES)

mvwgetnwstr	curs_getwstr(3CURSES)
mvwgetstr	curs_getstr(3CURSES)
mvwgetwch	curs_getwch(3CURSES)
mvwgetwstr	curs_getwstr(3CURSES)
mvwin	curs_window(3CURSES)
mvwinch	curs_inch(3CURSES)
mvwinchnstr	curs_inchstr(3CURSES)
mvwinchstr	curs_inchstr(3CURSES)
mvwinnstr	curs_instr(3CURSES)
mvwinnwstr	curs_inwstr(3CURSES)
mvwinsch	curs_insch(3CURSES)
mvwinsnstr	curs_insstr(3CURSES)
mvwinsstr	curs_insstr(3CURSES)
mvwinstr	curs_instr(3CURSES)
mvwinswch	curs_inswch(3CURSES)
mvwinswstr	curs_inswstr(3CURSES)
mvwinwch	curs_inwch(3CURSES)
mvwinwchnstr	curs_inwchstr(3CURSES)
mvwinwchstr	curs_inwchstr(3CURSES)
mvwinwstr	curs_inwstr(3CURSES)
mvwprintw	curs_printw(3CURSES)
mvwscanw	curs_scanw(3CURSES)
napms	curs_kernel(3CURSES)
newpad	curs_pad(3CURSES)
newterm	curs_initscr(3CURSES)
newwin	curs_window(3CURSES)
nl	curs_outopts(3CURSES)
nocbreak	curs_inopts(3CURSES)
nodelay	curs_inopts(3CURSES)
noecho	curs_inopts(3CURSES)
nonl	curs_outopts(3CURSES)

curses(3CURSES)

noqiflush	curs_inopts(3CURSES)
noraw	curs_inopts(3CURSES)
notimeout	curs_inopts(3CURSES)
overlay	curs_overlay(3CURSES)
overwrite	curs_overlay(3CURSES)
pair_content	curs_color(3CURSES)
pechochar	curs_pad(3CURSES)
pechowchar	curs_pad(3CURSES)
pnoutrefresh	curs_pad(3CURSES)
prefresh	curs_pad(3CURSES)
printw	curs_printw(3CURSES)
putp	curs_terminfo(3CURSES)
putwin	curs_util(3CURSES)
qiflush	curs_inopts(3CURSES)
raw	curs_inopts(3CURSES)
redrawwin	curs_refresh(3CURSES)
refresh	curs_refresh(3CURSES)
reset_prog_mode	curs_kernel(3CURSES)
reset_shell_mode	curs_kernel(3CURSES)
resetty	curs_kernel(3CURSES)
restartterm	curs_terminfo(3CURSES)
ripoffline	curs_kernel(3CURSES)
savetty	curs_kernel(3CURSES)
scanw	curs_scanw(3CURSES)
scr_dump	curs_scr_dump(3CURSES)
scr_init	curs_scr_dump(3CURSES)
scr_restore	curs_scr_dump(3CURSES)
scr_set	curs_scr_dump(3CURSES)
scroll	curs_scroll(3CURSES)
scrollok	curs_outopts(3CURSES)
set_curterm	curs_terminfo(3CURSES)

curses(3CURSES)

set_term	curs_initscr(3CURSES)
setscrreg	curs_outopts(3CURSES)
setsyx	curs_kernel(3CURSES)
setterm	curs_terminfo(3CURSES)
setupterm	curs_terminfo(3CURSES)
slk_atroff	curs_slk(3CURSES)
slk_atron	curs_slk(3CURSES)
slk_attrset	curs_slk(3CURSES)
slk_clear	curs_slk(3CURSES)
slk_init	curs_slk(3CURSES)
slk_label	curs_slk(3CURSES)
slk_noutrefresh	curs_slk(3CURSES)
slk_refresh	curs_slk(3CURSES)
slk_restore	curs_slk(3CURSES)
slk_set	curs_slk(3CURSES)
slk_touch	curs_slk(3CURSES)
srcl	curs_scroll(3CURSES)
standend	curs_attr(3CURSES)
standout	curs_attr(3CURSES)
start_color	curs_color(3CURSES)
subpad	curs_pad(3CURSES)
subwin	curs_window(3CURSES)
syncok	curs_window(3CURSES)
termattrs	curs_termattrs(3CURSES)
termname	curs_termattrs(3CURSES)
tgetent	curs_termcap(3CURSES)
tgetflag	curs_termcap(3CURSES)
tgetnum	curs_termcap(3CURSES)
tgetstr	curs_termcap(3CURSES)
tgoto	curs_termcap(3CURSES)
tigetflag	curs_terminfo(3CURSES)

curses(3CURSES)

tigetnum	curs_terminfo(3CURSES)
tigetstr	curs_terminfo(3CURSES)
timeout	curs_inopts(3CURSES)
touchline	curs_touch(3CURSES)
touchwin	curs_touch(3CURSES)
tparm	curs_terminfo(3CURSES)
tputs	curs_terminfo(3CURSES)
typeahead	curs_inopts(3CURSES)
unctrl	curs_util(3CURSES)
ungetch	curs_getch(3CURSES)
ungetwch	curs_getwch(3CURSES)
untouchwin	curs_touch(3CURSES)
use_env	curs_util(3CURSES)
vidattr	curs_terminfo(3CURSES)
vidputs	curs_terminfo(3CURSES)
vwprintw	curs_printw(3CURSES)
vwscanw	curs_scanw(3CURSES)
waddch	curs_addch(3CURSES)
waddchnstr	curs_addchstr(3CURSES)
waddchstr	curs_addchstr(3CURSES)
waddnstr	curs_addstr(3CURSES)
waddnwstr	curs_addwstr(3CURSES)
waddstr	curs_addstr(3CURSES)
waddwch	curs_addwch(3CURSES)
waddwchnstr	curs_addwchstr(3CURSES)
waddwchstr	curs_addwchstr(3CURSES)
waddwstr	curs_addwstr(3CURSES)
wadjcurspos	curs_alecompat(3CURSES)
wattroff	curs_attr(3CURSES)
wattron	curs_attr(3CURSES)
wattrset	curs_attr(3CURSES)

wbkgd	curs_bkgd(3CURSES)
wbkgdset	curs_bkgd(3CURSES)
wborder	curs_border(3CURSES)
wclear	curs_clear(3CURSES)
wclrto bot	curs_clear(3CURSES)
wclrtoeol	curs_clear(3CURSES)
wcursyncup	curs_window(3CURSES)
wdelch	curs_delch(3CURSES)
wdeleteln	curs_deleteln(3CURSES)
wechochar	curs_addch(3CURSES)
wechowchar	curs_addwch(3CURSES)
werase	curs_clear(3CURSES)
wgetch	curs_getch(3CURSES)
wgetnstr	curs_getstr(3CURSES)
wgetnwstr	curs_getwstr(3CURSES)
wgetstr	curs_getstr(3CURSES)
wgetwch	curs_getwch(3CURSES)
wgetwstr	curs_getwstr(3CURSES)
whline	curs_border(3CURSES)
winch	curs_inch(3CURSES)
winchnstr	curs_inchstr(3CURSES)
winchstr	curs_inchstr(3CURSES)
winnstr	curs_instr(3CURSES)
winnwstr	curs_inwstr(3CURSES)
winsch	curs_insch(3CURSES)
winsdelln	curs_deleteln(3CURSES)
winsertln	curs_deleteln(3CURSES)
winsnstr	curs_insstr(3CURSES)
winsnwstr	curs_inswstr(3CURSES)
winsstr	curs_insstr(3CURSES)
winstr	curs_instr(3CURSES)

curses(3CURSES)

winsch	curs_insch(3CURSES)
winswstr	curs_inswstr(3CURSES)
winch	curs_inch(3CURSES)
winchnstr	curs_inchstr(3CURSES)
winchstr	curs_inchstr(3CURSES)
winwstr	curs_inwstr(3CURSES)
wmove	curs_move(3CURSES)
wmovenextch	curs_alecompat(3CURSES)
wmoveprevch	curs_alecompat(3CURSES)
wnoutrefresh	curs_refresh(3CURSES)
wprintw	curs_printw(3CURSES)
wredrawln	curs_refresh(3CURSES)
wrefresh	curs_refresh(3CURSES)
wscanw	curs_scanw(3CURSES)
wscr1	curs_scroll(3CURSES)
wsetscrreg	curs_outopts(3CURSES)
wstandend	curs_attr(3CURSES)
wstandout	curs_attr(3CURSES)
wsyncdown	curs_window(3CURSES)
wsyncup	curs_window(3CURSES)
wtimeout	curs_inopts(3CURSES)
wtouchln	curs_touch(3CURSES)
wvline	curs_border(3CURSES)

RETURN VALUES

Routines that return an integer return `ERR` upon failure and an integer value other than `ERR` upon successful completion, unless otherwise noted in the routine descriptions.

All macros return the value of the `w` version, except `setscrreg()`, `wsetscrreg()`, `getyx()`, `getbegyx()`, and `getmaxyx()`. The return values of `setscrreg()`, `wsetscrreg()`, `getyx()`, `getbegyx()`, and `getmaxyx()` are undefined (that is, these should not be used as the right-hand side of assignment statements).

Routines that return pointers return `NULL` on error.

curses(3CURSES)

ATTRIBUTES See `attributes(5)` for descriptions of the following attributes:

ATTRIBUTE TYPE	ATTRIBUTE VALUE
MT-Level	Unsafe

SEE ALSO `curses(3XCURSES)`, `libcurses(3LIB)`, `libcurses(3XCURSES)`, `terminfo(4)`, `attributes(5)`

NOTES The header `<curses.h>` automatically includes the headers `<stdio.h>` and `<unctrl.h>`.

curses(3XCURSES)

NAME	curses – introduction and overview of X/Open Curses
DESCRIPTION	<p>The Curses screen management package conforms fully with Issue 4, Version 2 of the X/Open Curses specification. It provides a set of internationalized functions and macros for creating and modifying input and output to a terminal screen. This includes functions for creating windows, highlighting text, writing to the screen, reading from user input, and moving the cursor.</p> <p>X/Open Curses is a terminal-independent package, providing a common user interface to a variety of terminal types. Its portability is facilitated by the Terminfo database which contains a compiled definition of each terminal type. By referring to the database information X/Open Curses gains access to low-level details about individual terminals.</p> <p>X/Open Curses tailors its activities to the terminal type specified by the <code>TERM</code> environment variable. The <code>TERM</code> environment variable may be set in the Korn Shell (see <code>ksh(1)</code>) by typing:</p> <pre>export TERM=terminal_name</pre> <p>To set environment variables using other command line interfaces or shells, see the <code>environ(5)</code> manual page.</p> <p>Three additional environment variables are useful, and can be set in the Korn Shell:</p> <ol style="list-style-type: none">1. If you have an alternate Terminfo database containing terminal types that are not available in the system default database <code>/usr/share/lib/terminfo</code>, you can specify the <code>TERMINFO</code> environment variable to point to this alternate database: <pre>export TERMINFO=path</pre><p>This <i>path</i> specifies the location of the alternate compiled Terminfo database whose structure consists of directory names 0 to 9 and a to z (which represent the first letter of the compiled terminal definition file name). The alternate database specified by <code>TERMINFO</code> is examined before the system default database. If the terminal type specified by <code>TERM</code> cannot be found in either database, the default terminal type <i>dumb</i> is assumed.</p>2. To specify a window width smaller than your screen width (for example, in situations where your communications line is slow), set the <code>COLUMNS</code> environment variable to the number of vertical columns you want between the left and right margins: <pre>export COLUMNS=number</pre><p>The <i>number</i> of columns may be set to a number smaller than the screen size; however, if set larger than the screen or window width, the results are undefined. The value set using this environment variable takes precedence over the value normally used for the terminal.</p>3. To specify a window height smaller than your current screen height (for example, in situations where your communications line is slow), override the <code>LINES</code> environment variable by setting it to a smaller number of horizontal lines:

```
export LINES=number
```

The *number* of lines may be set to a number smaller than the screen height; however, if set larger than the screen or window height, the results are undefined. The value set using this environment variable takes precedence over the value normally used for the terminal.

Data Types

X/Open Curses defines the following data types:

<code>attr_t</code>	An integral type that holds an OR-ed set of attributes. The attributes acceptable are those which begin with the <code>WA_</code> prefix .
<code>bool</code>	Boolean data type.
<code>cchar_t</code>	A type that refers to a string consisting of a spacing wide character, up to 5 non-spacing wide characters, and zero or more attributes of any type. See Attributes, Color Pairs, and Renditions . A null <code>cchar_t</code> object terminates arrays of <code>cchar_t</code> objects.
<code>chtype</code>	An integral type whose values are formed by OR-ing an "unsigned char" with a color pair. and with zero or more attributes. The attributes acceptable are those which begin with the <code>A_</code> prefix and <code>COLOR_PAIR(3XCURSES)</code>
<code>SCREEN</code>	An opaque data type associated with a terminal's display screen.
<code>TERMINAL</code>	An opaque data type associated with a terminal. It contains information about the terminal's capabilities (as defined by <code>terminfo</code>), the terminal modes, and current state of input/output operations.
<code>wchar_t</code>	An integral data type whose values represent wide characters.
<code>WINDOW</code>	An opaque data type associated with a window.

Screens, Windows, and Terminals

The X/Open Curses manual pages refer at various points to screens, windows (also subwindows, derived windows, and pads), and terminals. The following list defines each of these terms.

Screen	A screen is a terminal's physical output device. The <code>SCREEN</code> data type is associated with a terminal.
Window	Window objects are two-dimensional arrays of characters and their renditions. X/Open Curses provides <code>stdscr</code> , a default window which is the size of of the terminal screen. You can use the <code>newwin(3XCURSES)</code> function to create others.

To refer to a window, use a variable declared as `WINDOW *`. X/Open Curses includes both functions that modify `stdscr`, and more general versions that let you specify a window.

There are three sub-types of windows:

curses(3XCURSES)

Subwindow	A window which has been created within another window (the parent window) and whose position has been specified with absolute screen coordinates. The <code>derwin(3XCURSES)</code> and <code>subwin(3XCURSES)</code> functions can be used to create subwindows.
Derived Window	A subwindow whose position is defined relative to the parent window's coordinates rather than in absolute terms.
Pad	A special type of window that can be larger than the screen. For more information, see the <code>newpad(3XCURSES)</code> man page.
Terminal	A terminal is the input and output device which character-based applications use to interact with the user. The <code>TERMINAL</code> data type is associated with such a device.

Attributes, Color Pairs, and Renditions

A character's rendition consists of its attributes (such as underlining or reverse video) and its color pair (the foreground and background colors). When using `waddstr(3XCURSES)`, `waddchstr(3XCURSES)`, `wprintw(3XCURSES)`, `winsch(3XCURSES)`, and so on, the window's rendition is combined with that character's renditions. The window rendition is the attributes and color set using the `attroff(3XCURSES)` and `attr_off(3XCURSES)` sets of functions. The window's background character and rendition are set with the `bkgdset(3XCURSES)` and `bkgdset(3XCURSES)` sets of functions.

When spaces are written to the screen, the background character and window rendition replace the space. For example, if the background rendition and character is `A_UNDERLINE | '*'`, text written to the window appears underlined and the spaces appear as underlined asterisks.

Each character written retains the rendition that it has obtained. This allows the character to be copied "as is" to or from a window with the `addchstr(3XCURSES)` or `inch(3XCURSES)` functions.

A_ Constant Values for Attributes

You can specify [Attributes, Color Pairs, and Renditions](#) attributes using the constants listed in the tables below. The following constants modify objects of type `chtype`:

Constant	Description
<code>A_ALTCHARSET</code>	Alternate character set
<code>A_ATTRIBUTES</code>	Bit-mask to extract attributes
<code>A_BLINK</code>	Blinking

Constant	Description
A_BOLD	Bold
A_CHARTEXT	Bit-mask to extract a character
A_COLOR	Bit-mask to extract color-pair information
A_DIM	Half-bright
A_INVIS	Invisible
A_PROTECT	Protected
A_REVERSE	Reverse video
A_STANDOUT	Highlights specific to terminal
A_UNDERLINE	Underline

WA_ Constant Values for Attributes

The following constants modify objects of type `attr_t`:

Constant	Description
WA_ALTCHARSET	Alternate character set
WA_ATTRIBUTES	Attribute mask
WA_BLINK	Blinking
WA_BOLD	Bold
WA_DIM	Half-bright
WA_HORIZONTAL	Horizontal highlight
WA_INVIS	Invisible
WA_LEFT	Left highlist
WA_LOW	Low highlist
WA_PROTECT	Protected
WA_REVERSE	Reverse video
WA_RIGHT	Right highlight
WA_STANDOUT	Highlights specific to terminal
WA_TOP	Top highlight
WA_UNDERLINE	Underline
WA_VERTICAL	Vertical highlight

Color Macros

Colors always appear in pairs; the foreground color of the character itself and the background color of the field on which it is displayed. The following color macros are defined:

Macro	Description
COLOR_BLACK	Black
COLOR_BLUE	Blue
COLOR_GREEN	Green
COLOR_CYAN	Cyan
COLOR_RED	Red
COLOR_MAGENTA	Magenta
COLOR_YELLOW	Yellow
COLOR_WHITE	White

Together, a character's attributes and its color pair form the character's rendition. A character's rendition moves with the character during any scrolling or insert/delete operations. If your terminal lacks support for the specified rendition, X/Open Curses may substitute a different rendition.

The COLOR_PAIR(3XCURSES) function modifies a chtype object. The PAIR_NUMBER(3XCURSES) function extracts the color pair from a chtype object.

Functions for Modifying a Window's Color

The following functions modify a window's color:

Function	Description
attr_set(), wattr_set()	Change the window's rendition.
color_set(), wcolor_set()	Set the window's color

Non-Spacing Characters

When the wwidth(3C) function returns a width of zero for a character, that character is called a non-spacing character. Non-spacing characters can be written to a window. Each non-spacing character is associated with a spacing character (that is, one which does not have a width of zero) and modifies that character. You cannot address a non-spacing character directly. Whenever you perform an X/Open Curses operation on the associated character, you are implicitly addressing the non-spacing character.

	<p>Non-spacing characters do not have a rendition. For functions that use wide characters and a rendition, X/Open Curses ignores any rendition specified for non-spacing characters. Multi-column characters have one rendition that applies to all columns spanned.</p>
<p>Complex Characters</p>	<p>The <code>cchar_t</code> data type represents a complex character. A complex character may contain a spacing character, its associated non-spacing characters, and its rendition. This implementation of complex characters supports up to 5 non-spacing characters for each spacing character.</p> <p>When a <code>cchar_t</code> object representing a non-spacing complex character is written to the screen, its rendition is not used, but rather it becomes associated with the rendition of the existing character at that location. The <code>setcchar(3XCURSES)</code> function initializes an object of type <code>cchar_t</code>. The <code>getcchar(3XCURSES)</code> function extracts the contents of a <code>cchar_t</code> object.</p>
<p>Display Operations</p>	<p>In adding internationalization support to X/Open Curses, every attempt was made to minimize the number of changes to the historical CURSES package. This enables programs written to use the historical implementation of CURSES to use the internationalized version with little or no modification. The following rules apply to the internationalized X/Open Curses package:</p> <ul style="list-style-type: none"> ■ The cursor can be placed anywhere in the window. Window and screen origins are (0,0). ■ A multi-column character cannot be displayed in the last column, because the character would appear truncated. Instead, the background character is displayed in the last column and the multi-column character appears at the beginning of the next line. This is called wrapping. <p>If the original line is the last line in the scroll region and scrolling is enabled, X/Open Curses moves the contents of each line in the region to the previous line. The first line of the region is lost. The last line of the scrolling region contains any wrapped characters. The remainder of that line is filled with the background character. If scrolling is disabled, X/Open Curses truncates any character that would extend past the last column of the screen.</p> <ul style="list-style-type: none"> ■ Overwrites operate on screen columns. If displaying a single-column or multi-column character results in overwriting only a portion of a multi-column character or characters, background characters are displayed in place of the non-overwritten portions. ■ Insertions and deletions operate on whole characters. The cursor is moved to the first column of the character prior to performing the operation.
<p>Overlapping Windows</p>	<p>When windows overlap, it may be necessary to overwrite only part of a multi-column character. As mentioned earlier, the non-overwritten portions are replaced with the background character. This results in issues concerning the <code>overwrite(3XCURSES)</code>, <code>overlay(3XCURSES)</code>, <code>copywin(3XCURSES)</code>, <code>wnoutrefresh(3XCURSES)</code>, and <code>wrefresh(3XCURSES)</code> functions.</p>
<p>Special Characters</p>	<p>Some functions assign special meanings to certain special characters:</p>

curses(3XCURSES)

Backspace	Moves the cursor one column towards the beginning of the line. If the cursor was already at the beginning of the line, it remains there. All subsequent characters are added or inserted at this point.
Carriage Return	Moves the cursor to the beginning of the current line. If the cursor was already at the beginning of the line, it remains there. All subsequent characters are added or inserted at this point.
Newline	<p>When adding characters, X/Open Curses fills the remainder of the line with the background character (effectively truncating the newline) and scrolls the window as described earlier. All subsequent characters are inserted at the start of the new line.</p> <p>When inserting characters, X/Open Curses fills the remainder of the line with the background character (effectively truncating the line), moves the cursor to the beginning of a new line, and scrolls the window as described earlier. All subsequent characters are placed at the start of the new line.</p>
Tab	<p>moves subsequent characters to next horizontal tab stop. Default tab stops are set at 0, 8, 16, and so on.</p> <p>When adding or inserting characters, X/Open Curses inserts or adds the background character into each column until the next tab stop is reached. If there are no remaining tab stops on the current line, wrapping and scrolling occur as described earlier.</p>
Control Characters	When X/Open Curses functions perform special character processing, they convert control characters to the ^X notation, where X is a single-column character (uppercase, if it is a letter) and writes that notation to the window. Functions that retrieve text from the window will retrieve the converted notation not the original.
X/Open Curses displays non-printable bytes, that have their high bit set, using the M-X meta notation where X is the non-printable byte with its high bit turned off.	
Input Processing	There are four input modes possible with X/Open Curses that affect the behavior of input functions like <code>getch(3XCURSES)</code> and <code>getnstr(3XCURSES)</code> .
Line Canonical (Cooked)	In line input mode, the terminal driver handles the input of line units as well as SIGERASE and SIGKILL character processing. See <code>termio(7I)</code> for more information.

cbreak Mode	<p>In this mode, the <code>getch()</code> and <code>getnstr()</code> functions will not return until a complete line has been read by the terminal driver, at which point only the requested number of bytes/characters are returned. The rest of the line unit remains unread until subsequent call to the <code>getch()</code> or <code>getnstr()</code> functions.</p> <p>The functions <code>nocbreak(3XCURSES)</code> and <code>noraw(3XCURSES)</code> are used to enter this mode. These functions are described on the <code>cbreak(3XCURSES)</code> man page which also details which <code>termios</code> flags are enabled.</p> <p>Of the modes available, this one gives applications the least amount of control over input. However, it is the only input mode possible on a block mode terminal.</p> <p>Byte/character input provides a finer degree of control. The terminal driver passes each byte read to the application without interpreting erase and kill characters. It is the application's responsibility to handle line editing. It is unknown whether the signal characters (<code>SIGINTR</code>, <code>SIGQUIT</code>, <code>SIGSUSP</code>) and flow control characters (<code>SIGSTART</code>, <code>SIGSTOP</code>) are enabled. To ensure that they are, call the <code>noraw()</code> function first, then call the <code>cbreak()</code> function.</p>
halfdelay Mode	<p>This is the same as the <code>cbreak()</code> mode with a timeout. The terminal driver waits for a byte to be received or for a timer to expire, in which case the <code>getch()</code> function either returns a byte or <code>ERR</code> respectively. This mode overrides timeouts set for an individual window with the <code>wtimeout()</code> function.</p>
raw Mode	<p>This mode provides byte/character input with the most control for an application. It is similar to <code>cbreak()</code> mode, but also disables signal character processing (<code>SIGINTR</code>, <code>SIGSUSP</code>, <code>SIGQUIT</code>) and flow control processing (<code>SIGSTART</code>, <code>SIGSTOP</code>) so that the application can process them as it wants.</p>

These modes affect all X/Open Curses input. The default input mode is inherited from the parent process when the application starts up.

A timeout similar to `halfdelay(3XCURSES)` can be applied to individual windows (see `timeout(3XCURSES)`). The `nodelay(3XCURSES)` function is equivalent to setting `wtimeout(3XCURSES)` for a window with a zero timeout (non-blocking) or infinite delay (blocking).

curses(3XCURSES)

To handle function keys, `keypad(3XCURSES)` must be enabled. When it is enabled, the `getch()` function returns a `KEY_` constant for a uniquely encoded key defined for that terminal. When `keypad()` is disabled, the `getch()` function returns the individual bytes composing the function key (see `getch(3XCURSES)` and `wget_wch(3XCURSES)`). By default, `keypad()` is disabled.

When processing function keys, once the first byte is recognized, a timer is set for each subsequent byte in the sequence. If any byte in the function key sequence is not received before the timer expires, the bytes already received are pushed into a buffer and the original first byte is returned. Subsequent X/Open Curses input would take bytes from the buffer until exhausted, after which new input from the terminal will be requested. Enabling and disabling of the function key interbyte timer is handled by the `notimeout(3XCURSES)` function. By default, `notimeout()` is disabled (that is, the timer is used).

X/Open Curses always disables the terminal driver's echo processing. The `echo(3XCURSES)` and `noecho(3XCURSES)` functions control X/Open Curses software echoing. When software echoing is enabled, X/Open Curses input functions echo printable characters, control keys, and meta keys in the input window at the last cursor position. Functions keys are never echoed. When software echoing is disabled, it is the application's responsibility to handle echoing.

EXAMPLES

EXAMPLE 1 Copying Single-Column Characters Over Single-Column Characters

In the upcoming examples, some characters have special meanings:

- {, [, and (represent the left halves of multi-column characters. },], and) represent the corresponding right halves of the same multi-column characters.
- Alphanumeric characters and periods (.) represent single-column characters.
- The number sign (#) represents the background character.

```
copywin(s, t, 0, 1, 0, 1, 1, 3, 0)
```

s	t	→	t
abcdefbcd..
ghijklhij..

There are no special problems with this situation.

EXAMPLE 2 Copying Multi-column Characters Over Single-Column Characters

```
copywin(s, t, 0, 1, 0, 1, 1, 3, 0)
```

s	t	→	t
a[]def[]d..
gh()klh()..

There are no special problems with this situation.

EXAMPLE 3 Copying Single-Column Characters From Source Overlaps Multi-column Characters In Target

```
copywin(s, t, 0, 1, 0, 1, 1, 3, 0)
```

s	t	→	t
abcdef	[]...		#bcd..
ghijk tol	...().		.hij#.

Overwriting multi-column characters in `t` has resulted in the `#` background characters being required to erase the remaining halves of the target's multi-column characters.

EXAMPLE 4 Copy Incomplete Multi-column Characters From Source To Target.

```
copywin(s, t, 0, 1, 0, 1, 1, 3, 0)
```

s	t	→	t
[]cdef	123456		[]cd56
ghi()l	789012		7hi()2

The `]` and `(` halves of the multi-column characters have been copied from the source and expanded in the target outside of the specified target region.

Consider a pop-up dialog box that contains single-column characters and a base window that contains multi-column characters and you do the following:

```
save=dupwin(dialog); /* create backing store */
overwrite(cursor, save); /* save region to be overlaid */
wrefresh(dialog); /* display dialog */
wrefresh(save); /* restore screen image */
delwin(save); /* release backing store */
```

You can use code similar to this to implement generic `popup()` and `popdown()` routines in a variety of CURSES implementations (including BSD UNIX, and UNIX System V). In the simple case where the base window contains single-column characters only, it would correctly restore the image that appeared on the screen before the dialog box was displayed.

However, with multi-column characters, the `overwrite()` function might save a region with incomplete multi-column characters. The `wrefresh(dialog)` statement results in the behavior described in example 3 above. The behavior described in this example (that is, example 4) allows the `wrefresh(save)` statement to restore the window correctly.

EXAMPLE 5 Copying An Incomplete Multi-column Character To Region Next To Screen Margin (Not A Window Edge)

Two cases of copying an incomplete multi-column character to a region next to a screen margin follow:

```
copywin(s, t, 0, 1, 0, 0, 1, 2, 0)
```

s	t	→	t
[]cdef	123456		#cd456

curses(3XCURSES)

EXAMPLE 5 Copying An Incomplete Multi-column Character To Region Next To Screen Margin (Not A Window Edge) *(Continued)*

```
          ghijkl      789012          hij012
```

The background character (#) replaces the] character that would have been copied from the source, because it is not possible to expand the multi-column character to its complete form.

```
copywin(s, t, 0, 1, 0, 3, 1, 5, 0)
```

```
          s          t          →          t
abcdef      123456      123bcd
ghi()1      789012      789hi#
```

This second example is the same as the first, but with the right margin.

ATTRIBUTES

See `attributes(5)` for descriptions of the following attributes:

ATTRIBUTE TYPE	ATTRIBUTE VALUE
Interface Stability	Standard
MT-Level	Unsafe

SEE ALSO

`ksh(1)`, `COLOR_PAIR(3XCURSES)`, `PAIR_NUMBER(3XCURSES)`, `addchstr(3XCURSES)`, `attr_off(3XCURSES)`, `attroff(3XCURSES)`, `bkgdset(3XCURSES)`, `bkgrndset(3XCURSES)`, `cbreak(3XCURSES)`, `copywin(3XCURSES)`, `derwin(3XCURSES)`, `echo(3XCURSES)`, `getcchar(3XCURSES)`, `getch(3XCURSES)`, `getnstr(3XCURSES)`, `halfdelay(3XCURSES)`, `inch(3XCURSES)`, `keypad(3XCURSES)`, `libcurses(3XCURSES)`, `newpad(3XCURSES)`, `newwin(3XCURSES)`, `nocbreak(3XCURSES)`, `nodelay(3XCURSES)`, `noecho(3XCURSES)`, `noraw(3XCURSES)`, `notimeout(3XCURSES)`, `overlay(3XCURSES)`, `overwrite(3XCURSES)`, `setcchar(3XCURSES)`, `subwin(3XCURSES)`, `timeout(3XCURSES)`, `waddchstr(3XCURSES)`, `waddstr(3XCURSES)`, `wcwidth(3C)`, `wget_wch(3XCURSES)`, `winsch(3XCURSES)`, `wnoutrefresh(3XCURSES)`, `wprintw(3XCURSES)`, `wrefresh(3XCURSES)`, `wtimeout(3XCURSES)`, `attributes(5)`, `environ(5)`, `standards(5)`, `termio(7I)`

NAME | curs_getch, getch, wgetch, mvgetch, mvwgetch, ungetch – get (or push back) characters from curses terminal keyboard

SYNOPSIS | `cc [flag ...] file ... -lcurses [library ...]`
`#include <curses.h>`
`int getch(void);`
`int wgetch(WINDOW *win);`
`int mvgetch(int y, int x);`
`int mvwgetch(WINDOW *win, int y, int x);`
`int ungetch(int ch);`

DESCRIPTION | With the `getch()`, `wgetch()`, `mvgetch()`, and `mvwgetch()` routines a character is read from the terminal associated with the window. In no-delay mode, if no input is waiting, the value `ERR` is returned. In delay mode, the program waits until the system passes text through to the program. Depending on the setting of `cbreak()`, this is after one character (`cbreak` mode), or after the first newline (`nocbreak` mode). In half-delay mode, the program waits until a character is typed or the specified timeout has been reached. Unless `noecho()` has been set, the character will also be echoed into the designated window.

If the window is not a pad, and it has been moved or modified since the last call to `wrefresh()`, `wrefresh()` will be called before another character is read.

If `keypad()` is `TRUE`, and a function key is pressed, the token for that function key is returned instead of the raw characters. Possible function keys are defined in `<curses.h>` with integers beginning with `0401`, whose names begin with `KEY_`. If a character that could be the beginning of a function key (such as escape) is received, `curses` sets a timer. If the remainder of the sequence does not come in within the designated time, the character is passed through; otherwise, the function key value is returned. For this reason, many terminals experience a delay between the time a user presses the escape key and the escape is returned to the program. Since tokens returned by these routines are outside the ASCII range, they are not printable.

The `ungetch()` routine places `ch` back onto the input queue to be returned by the next call to `wgetch()`.

Function Keys | The following function keys, defined in `<curses.h>`, might be returned by `getch()` if `keypad()` has been enabled. Note that not all of these may be supported on a particular terminal if the terminal does not transmit a unique code when the key is pressed or if the definition for the key is not present in the `terminfo` database.

<i>Name</i>	<i>Key name</i>
KEY_BREAK	Break key
KEY_DOWN	The four arrow keys ...

curs_getch(3CURSES)

<i>Name</i>	<i>Key name</i>
KEY_UP	
KEY_LEFT	
KEY_RIGHT	
KEY_HOME	Home key (upward+left arrow)
KEY_BACKSPACE	Backspace
KEY_F0	Function keys; space for 64 keys is reserved.
KEY_F(<i>n</i>)	For $0 \leq n \leq 63$
KEY_DL	Delete line
KEY_IL	Insert line
KEY_DC	Delete character
KEY_IC	Insert char or enter insert mode
KEY_EIC	Exit insert char mode
KEY_CLEAR	Clear screen
KEY_EOS	Clear to end of screen
KEY_EOL	Clear to end of line
KEY_SF	Scroll 1 line forward
KEY_SR	Scroll 1 line backward (reverse)
KEY_NPAGE	Next page
KEY_PPAGE	Previous page
KEY_STAB	Set tab
KEY_CTAB	Clear tab
KEY_CATAB	Clear all tabs
KEY_ENTER	Enter or send
KEY_SRESET	Soft (partial) reset
KEY_RESET	Reset or hard reset
KEY_PRINT	Print or copy
KEY_LL	Home down or bottom (lower left). Keypad is arranged like this: (Row 1) A1 up A3 (Row 2) left B2 right (Row 3) C1 down C3
KEY_A1	Upper left of keypad

<i>Name</i>	<i>Key name</i>
KEY_A3	Upper right of keypad
KEY_B2	Center of keypad
KEY_C1	Lower left of keypad
KEY_C3	Lower right of keypad
KEY_BTAB	Back tab key
KEY_BEG	Beg(inning) key
KEY_CANCEL	Cancel key
KEY_CLOSE	Close key
KEY_COMMAND	Cmd (command) key
KEY_COPY	Copy key
KEY_CREATE	Create key
KEY_END	End key
KEY_EXIT	Exit key
KEY_FIND	Find key
KEY_HELP	Help key
KEY_MARK	Mark key
KEY_MESSAGE	Message key
KEY_MOVE	Move key
KEY_NEXT	Next object key
KEY_OPEN	Open key
KEY_OPTIONS	Options key
KEY_PREVIOUS	Previous object key
KEY_REDO	Redo key
KEY_REFERENCE	Reference key
KEY_REFRESH	Refresh key
KEY_REPLACE	Replace key
KEY_RESTART	Restart key
KEY_RESUME	Resume key
KEY_SAVE	Save key

curs_getch(3CURSES)

<i>Name</i>	<i>Key name</i>
KEY_SBEG	Shifted beginning key
KEY_SCANCEL	Shifted cancel key
KEY_SCOMMAND	Shifted command key
KEY_SCOPY	Shifted copy key
KEY_SCREATE	Shifted create key
KEY_SDC	Shifted delete char key
KEY_SDL	Shifted delete line key
KEY_SELECT	Select key
KEY_SEND	Shifted end key
KEY_SEOL	Shifted clear line key
KEY_SEXIT	Shifted exit key
KEY_SFIND	Shifted find key
KEY_SHELP	Shifted help key
KEY_SHOME	Shifted home key
KEY_SIC	Shifted input key
KEY_SLEFT	Shifted left arrow key
KEY_SMESSAGE	Shifted message key
KEY_SMOVE	Shifted move key
KEY_SNEXT	Shifted next key
KEY_SOPTIONS	Shifted options key
KEY_SPREVIOUS	Shifted prev key
KEY_SPRINT	Shifted print key
KEY_SREDO	Shifted redo key
KEY_SREPLACE	Shifted replace key
KEY_SRIGHT	Shifted right arrow
KEY_SRSUME	Shifted resume key
KEY_SSAVE	Shifted save key
KEY_SSUSPEND	Shifted suspend key
KEY_SUNDO	Shifted undo key

<i>Name</i>	<i>Key name</i>
KEY_SUSPEND	Suspend key
KEY_UNDO	Undo key

RETURN VALUES All routines return the integer ERR upon failure. The ungetch() routine returns an integer value other than ERR upon successful completion. The other routines return the next input character or function key code upon successful completion.

ATTRIBUTES See attributes(5) for descriptions of the following attributes:

ATTRIBUTE TYPE	ATTRIBUTE VALUE
MT-Level	Unsafe

SEE ALSO curs_inopts(3CURSES), curs_move(3CURSES), curs_refresh(3CURSES), curses(3CURSES), attributes(5)

NOTES The header < curses.h > automatically includes the headers < stdio.h > and < unctrl.h >.

Use of the escape key for a single character function is discouraged.

When using getch(), wgetch(), mvgetch(), or mvwgetch(), nocbreak mode (nocbreak()) and echo mode (echo()) should not be used at the same time. Depending on the state of the tty driver when each character is typed, the program may produce undesirable results.

Note that getch(), mvgetch(), and mvwgetch() may be macros.

curs_getstr(3CURSES)

NAME	curs_getstr, getstr, wgetstr, mvgetstr, mvwgetstr, wgetnstr – get character strings from curses terminal keyboard				
SYNOPSIS	<pre>cc [flag ...] file ... -lcurses [library ...] #include <curses.h> int getstr(char *str); int wgetstr(WINDOW *win, char *str); int mvgetstr(int y, int x, char *str); int mvwgetstr(WINDOW *win, int y, int x, char *str); int wgetnstr(WINDOW *win, char *str, int n);</pre>				
DESCRIPTION	The effect of <code>getstr()</code> is as though a series of calls to <code>getch()</code> were made, until a newline or carriage return is received. The resulting value is placed in the area pointed to by the character pointer <code>str</code> . <code>wgetnstr()</code> reads at most <code>n</code> characters, thus preventing a possible overflow of the input buffer. The user's erase and kill characters are interpreted, as well as any special keys (such as function keys, HOME key, and CLEAR key.)				
RETURN VALUES	All routines return the integer ERR upon failure and an integer value other than ERR upon successful completion.				
ATTRIBUTES	See <code>attributes(5)</code> for descriptions of the following attributes:				
	<table border="1"><thead><tr><th>ATTRIBUTE TYPE</th><th>ATTRIBUTE VALUE</th></tr></thead><tbody><tr><td>MT-Level</td><td>Unsafe</td></tr></tbody></table>	ATTRIBUTE TYPE	ATTRIBUTE VALUE	MT-Level	Unsafe
ATTRIBUTE TYPE	ATTRIBUTE VALUE				
MT-Level	Unsafe				
SEE ALSO	<code>curs_getch(3CURSES)</code> , <code>curses(3CURSES)</code> , <code>attributes(5)</code>				
NOTES	The header <code><curses.h></code> automatically includes the headers <code><stdio.h></code> and <code><unctrl.h></code> . Note that <code>getstr()</code> , <code>mvgetstr()</code> , and <code>mvwgetstr()</code> may be macros.				

NAME | curs_getwch, getwch, wgetwch, mvgetwch, mvwgetwch, ungetwch – get (or push back) wchar_t characters from curses terminal keyboard

SYNOPSIS | `cc [flag ...] file ... -lcurses [library ..]`
`#include <curses.h>`
`int getwch(void);`
`int wgetwch(WINDOW *win);`
`int mvgetwch(int y, int x);`
`int mvwgetwch(WINDOW *win, int y, int x);`
`int ungetwch(int wch);`

DESCRIPTION | The `getwch()`, `wgetwch()`, `mvgetwch()`, and `mvwgetwch()` routines read an EUC character from the terminal associated with the window, transform it into a `wchar_t` character, and return a `wchar_t` character. In no-delay mode, if no input is waiting, the value `ERR` is returned. In delay mode, the program waits until the system passes text through to the program. Depending on the setting of `cbreak`, this is after one character (`cbreak` mode), or after the first newline (`nocbreak` mode). In half-delay mode, the program waits until a character is typed or the specified timeout has been reached. Unless `noecho` has been set, the character will also be echoed into the designated window.

If the window is not a pad, and it has been moved or modified since the last call to `wrefresh(3CURSES)`, `wrefresh` will be called before another character is read.

If `keypad` is `TRUE`, and a function key is pressed, the token for that function key is returned instead of the raw characters. Possible function keys are defined in `<curses.h>` with integers beginning with `0401`, whose names begin with `KEY_`. If a character that could be the beginning of a function key (such as escape) is received, `curses(3CURSES)` sets a timer. If the remainder of the sequence does not come in within the designated time, the character is passed through; otherwise, the function key value is returned. For this reason, many terminals experience a delay between the time a user presses the escape key and the escape is returned to the program.

The `ungetwch()` routine places `wch` back onto the input queue to be returned by the next call to `wgetwch()`.

Function Keys | The following function keys, defined in `<curses.h>`, might be returned by `getwch()` if `keypad` has been enabled. Note that not all of these may be supported on a particular terminal if the terminal does not transmit a unique code when the key is pressed or if the definition for the key is not present in the `terminfo(4)` database.

<i>Name</i>	<i>Key name</i>
KEY_BREAK	Break key
KEY_DOWN	The four arrow keys ...

curs_getwch(3CURSES)

<i>Name</i>	<i>Key name</i>
KEY_UP	
KEY_LEFT	
KEY_RIGHT	
KEY_HOME	Home key (upward+left arrow)
KEY_BACKSPACE	Backspace
KEY_F0	Function keys; space for 64 keys is reserved.
KEY_F(<i>n</i>)	For $0 \leq n \leq 63$
KEY_DL	Delete line
KEY_IL	Insert line
KEY_DC	Delete character
KEY_IC	Insert char or enter insert mode
KEY_EIC	Exit insert char mode
KEY_CLEAR	Clear screen
KEY_EOS	Clear to end of screen
KEY_EOL	Clear to end of line
KEY_SF	Scroll 1 line forward
KEY_SR	Scroll 1 line backward (reverse)
KEY_NPAGE	Next page
KEY_PPAGE	Previous page
KEY_STAB	Set tab
KEY_CTAB	Clear tab
KEY_CATAB	Clear all tabs
KEY_ENTER	Enter or send
KEY_SRESET	Soft (partial) reset
KEY_RESET	Reset or hard reset
KEY_PRINT	Print or copy
KEY_LL	Home down or bottom (lower left). Keypad is arranged like this: A1 up A3 left B2 right C1 down C3
KEY_A1	Upper left of keypad

<i>Name</i>	<i>Key name</i>
KEY_A3	Upper right of keypad
KEY_B2	Center of keypad
KEY_C1	Lower left of keypad
KEY_C3	Lower right of keypad
KEY_BTAB	Back tab key
KEY_BEG	Beg(inning) key
KEY_CANCEL	Cancel key
KEY_CLOSE	Close key
KEY_COMMAND	Cmd (command) key
KEY_COPY	Copy key
KEY_CREATE	Create key
KEY_END	End key
KEY_EXIT	Exit key
KEY_FIND	Find key
KEY_HELP	Help key
KEY_MARK	Mark key
KEY_MESSAGE	Message key
KEY_MOVE	Move key
KEY_NEXT	Next object key
KEY_OPEN	Open key
KEY_OPTIONS	Options key
KEY_PREVIOUS	Previous object key
KEY_REDO	Redo key
KEY_REFERENCE	Reference key
KEY_REFRESH	Refresh key
KEY_REPLACE	Replace key
KEY_RESTART	Restart key
KEY_RESUME	Resume key
KEY_SAVE	Save key

curs_getwch(3CURSES)

<i>Name</i>	<i>Key name</i>
KEY_SBEG	Shifted beginning key
KEY_SCANCEL	Shifted cancel key
KEY_SCOMMAND	Shifted command key
KEY_SCOPY	Shifted copy key
KEY_SCREATE	Shifted create key
KEY_SDC	Shifted delete char key
KEY_SDL	Shifted delete line key
KEY_SELECT	Select key
KEY_SEND	Shifted end key
KEY_SEOL	Shifted clear line key
KEY_SEXIT	Shifted exit key
KEY_SFIND	Shifted find key
KEY_SHELP	Shifted help key
KEY_SHOME	Shifted home key
KEY_SIC	Shifted input key
KEY_SLEFT	Shifted left arrow key
KEY_SMESSAGE	Shifted message key
KEY_SMOVE	Shifted move key
KEY_SNEXT	Shifted next key
KEY_SOPTIONS	Shifted options key
KEY_SPREVIOUS	Shifted prev key
KEY_SPRINT	Shifted print key
KEY_SREDO	Shifted redo key
KEY_SREPLACE	Shifted replace key
KEY_SRIGHT	Shifted right arrow
KEY_SRSUME	Shifted resume key
KEY_SSAVE	Shifted save key
KEY_SSUSPEND	Shifted suspend key
KEY_SUNDO	Shifted undo key

`curs_getwch(3CURSES)`

<i>Name</i>	<i>Key name</i>
KEY_SUSPEND	Suspend key
KEY_UNDO	Undo key

RETURN VALUE All routines return the integer `ERR` upon failure and an integer value other than `ERR` upon successful completion.

ATTRIBUTES See `attributes(5)` for descriptions of the following attributes:

ATTRIBUTE TYPE	ATTRIBUTE VALUE
MT-Level	Unsafe

SEE ALSO `curses(3CURSES)`, `curs_inopts(3CURSES)`, `curs_move(3CURSES)`, `wrefresh(3CURSES)`, `terminfo(4)`, `attributes(5)`

NOTES The header file `<curses.h>` automatically includes the header files `<stdio.h>`, `<unctrl.h>` and `<widec.h>`.

Use of the escape key by a programmer for a single character function is discouraged.

When using `getwch()`, `wgetwch()`, `mvgetwch()`, or `mvwgetwch()`, `nocbreak` mode and `echo` mode should not be used at the same time. Depending on the state of the tty driver when each character is typed, the program may produce undesirable results.

Note that `getwch()`, `mvgetwch()`, and `mvwgetwch()` may be macros.

curs_getwstr(3CURSES)

NAME	<code>curs_getwstr</code> , <code>getwstr</code> , <code>getnwstr</code> , <code>wgetwstr</code> , <code>wgetnwstr</code> , <code>mvgetwstr</code> , <code>mvgetnwstr</code> , <code>mvwgetwstr</code> , <code>mvwgetnwstr</code> – get <code>wchar_t</code> character strings from curses terminal keyboard				
SYNOPSIS	<pre>cc [flag ...] file ... -lcurses [library ..] #include <curses.h> int getwstr(wchar_t *wstr); int getnwstr(wchar_t *wstr, int n); int wgetwstr(WINDOW *win, wchar_t *wstr); int wgetnwstr(WINDOW *win, wchar_t *wstr, int n); int mvgetwstr(int y, int x, wchar_t *wstr); int mvgetnwstr(int y, int x, wchar_t *wstr, int n); int mvwgetwstr(WINDOW *win, int y, int x, wchar_t *wstr); int mvwgetnwstr(WINDOW *win, int y, int x, wchar_t *wstr, int n);</pre>				
DESCRIPTION	The effect of <code>getwstr()</code> is as though a series of calls to <code>getwch(3CURSES)</code> were made, until a newline and carriage return is received. The resulting value is placed in the area pointed to by the <code>wchar_t</code> pointer <code>wstr</code> . <code>getnwstr()</code> reads at most <code>n</code> <code>wchar_t</code> characters, thus preventing a possible overflow of the input buffer. The user's erase and kill characters are interpreted, as well as any special keys (such as function keys, HOME key, CLEAR key, etc.).				
RETURN VALUE	All routines return the integer <code>ERR</code> upon failure and an integer value other than <code>ERR</code> upon successful completion.				
ATTRIBUTES	See <code>attributes(5)</code> for a description of the following attributes:				
	<table border="1"><thead><tr><th>ATTRIBUTE TYPE</th><th>ATTRIBUTE VALUE</th></tr></thead><tbody><tr><td>MT-Level</td><td>Unsafe</td></tr></tbody></table>	ATTRIBUTE TYPE	ATTRIBUTE VALUE	MT-Level	Unsafe
ATTRIBUTE TYPE	ATTRIBUTE VALUE				
MT-Level	Unsafe				
SEE ALSO	<code>curses(3CURSES)</code> , <code>getwch(3CURSES)</code> , <code>attributes(5)</code>				
NOTES	The header file <code><curses.h></code> automatically includes the header files <code><stdio.h></code> , <code><unctrl.h></code> , and <code><widec.h></code> . Note that all routines except <code>wgetnwstr()</code> may be macros.				

NAME curs_getyx, getyx, getparyx, getbegyx, getmaxyx – get curses cursor and window coordinates

SYNOPSIS

```
cc [ flag ... ] file ... -lcurses [ library ... ]
#include <curses.h>

void getyx(WINDOW *win, int y, int x);
void getparyx(WINDOW *win, int y, int x);
void getbegyx(WINDOW *win, int y, int x);
void getmaxyx(WINDOW *win, int y, int x);
```

DESCRIPTION With the `getyx()` macro, the cursor position of the window is placed in the two integer variables `y` and `x`.

With the `getparyx()` macro, if `win` is a subwindow, the beginning coordinates of the subwindow relative to the parent window are placed into two integer variables, `y` and `x`. Otherwise, `-1` is placed into `y` and `x`.

Like `getyx()`, the `getbegyx()` and `getmaxyx()` macros store the current beginning coordinates and size of the specified window.

RETURN VALUES The return values of these macros are undefined (that is, they should not be used as the right-hand side of assignment statements).

ATTRIBUTES See `attributes(5)` for descriptions of the following attributes:

ATTRIBUTE TYPE	ATTRIBUTE VALUE
MT-Level	Unsafe

SEE ALSO `curses(3CURSES)`, `attributes(5)`

NOTES The header `<curses.h>` automatically includes the headers `<stdio.h>` and `<unctrl.h>`.

Note that all of these interfaces are macros and that “&” is not necessary before the variables `y` and `x`.

curs_inch(3CURSES)

NAME	curs_inch, inch, winch, mvinch, mvwinch – get a character and its attributes from a curses window				
SYNOPSIS	<pre>cc [flag ...] file ... -lcurses [library ...] #include <curses.h> ctype inch(void); ctype winch(WINDOW *win); ctype mvinch(int y, int x); ctype mvwinch(WINDOW *win, int y, int x);</pre>				
DESCRIPTION	With these routines, the character, of type <code>ctype</code> , at the current position in the named window is returned. If any attributes are set for that position, their values are OR-ed into the value returned. Constants defined in <code><curses.h></code> can be used with the logical AND (<code>&</code>) operator to extract the character or attributes alone.				
Attributes	The following bit-masks can be AND-ed with characters returned by <code>winch()</code> . A_CHARTEXT Bit-mask to extract character A_ATTRIBUTES Bit-mask to extract attributes A_COLOR Bit-mask to extract color-pair field information				
ATTRIBUTES	See <code>attributes(5)</code> for descriptions of the following attributes:				
	<table border="1"><thead><tr><th>ATTRIBUTE TYPE</th><th>ATTRIBUTE VALUE</th></tr></thead><tbody><tr><td>MT-Level</td><td>Unsafe</td></tr></tbody></table>	ATTRIBUTE TYPE	ATTRIBUTE VALUE	MT-Level	Unsafe
ATTRIBUTE TYPE	ATTRIBUTE VALUE				
MT-Level	Unsafe				
SEE ALSO	<code>curses(3CURSES)</code> , <code>attributes(5)</code>				
NOTES	The header <code><curses.h></code> automatically includes the headers <code><stdio.h></code> and <code><unctrl.h></code> . Note that all of these routines may be macros.				

NAME | curs_inchstr, inchstr, inchnstr, winchstr, winchnstr, mvinchstr, mvwinchnstr, mvwinchstr, mvwinchnstr – get a string of characters (and attributes) from a curses window

SYNOPSIS |

```
cc [ flag ... ] file ... -lcurses [ library ... ]
#include <curses.h>

int  inchstr(chtype *chstr);
int  inchnstr(chtype *chstr, int n);
int  winchstr(WINDOW *win, chtype *chstr);
int  winchnstr(WINDOW *win, chtype *chstr, int n);
int  mvinchstr(int y, int x, chtype *chstr);
int  mvwinchnstr(int y, int x, chtype *chstr, int n);
int  mvwinchstr(WINDOW *win, int y, int x, chtype *chstr);
int  mvwinchnstr(WINDOW *win, int y, int x, chtype *chstr, int n);
```

DESCRIPTION | With these routines, a string of type chtype, starting at the current cursor position in the named window and ending at the right margin of the window, is returned. The four functions with *n* as the last argument, return the string at most *n* characters long. Constants defined in <curses.h> can be used with the & (logical AND) operator to extract the character or the attribute alone from any position in the *chstr* (see curs_inch(3CURSES)).

RETURN VALUES | All routines return the integer ERR upon failure and an integer value other than ERR upon successful completion.

ATTRIBUTES | See attributes(5) for descriptions of the following attributes:

ATTRIBUTE TYPE	ATTRIBUTE VALUE
MT-Level	Unsafe

SEE ALSO | curs_inch(3CURSES), curses(3CURSES), attributes(5)

NOTES | The header <curses.h> automatically includes the headers <stdio.h> and <unctrl.h>. Note that all routines except winchnstr() may be macros.

curs_initscr(3CURSES)

NAME	<code>curs_initscr</code> , <code>initscr</code> , <code>newterm</code> , <code>endwin</code> , <code>isendwin</code> , <code>set_term</code> , <code>delscreen</code> – curses screen initialization and manipulation routines
SYNOPSIS	<pre>cc [<i>flag</i> ...] <i>file</i> ... -lcurses [<i>library</i> ...] #include <curses.h> WINDOW *initscr(void); int endwin(void); int isendwin(void); SCREEN *newterm(char *<i>type</i>, FILE *<i>outfd</i>, FILE *<i>infd</i>); SCREEN *set_term(SCREEN *<i>new</i>); void delscreen(SCREEN * <i>sp</i>);</pre>
DESCRIPTION	<p><code>initscr()</code> is almost always the first routine that should be called (the exceptions are <code>slk_init()</code>, <code>filter()</code>, <code>ripoffline()</code>, <code>use_env()</code> and, for multiple-terminal applications, <code>newterm()</code>.) This determines the terminal type and initializes all curses data structures. <code>initscr()</code> also causes the first call to <code>refresh()</code> to clear the screen. If errors occur, <code>initscr()</code> writes an appropriate error message to standard error and exits; otherwise, a pointer is returned to <code>stdscr()</code>. If the program needs an indication of error conditions, <code>newterm()</code> should be used instead of <code>initscr()</code>; <code>initscr()</code> should only be called once per application.</p> <p>A program that outputs to more than one terminal should use the <code>newterm()</code> routine for each terminal instead of <code>initscr()</code>. A program that needs an indication of error conditions, so it can continue to run in a line-oriented mode if the terminal cannot support a screen-oriented program, would also use this routine. The routine <code>newterm()</code> should be called once for each terminal. It returns a variable of type <code>SCREEN *</code> which should be saved as a reference to that terminal. The arguments are the <i>type</i> of the terminal to be used in place of <code>\$TERM</code>, a file pointer for output to the terminal, and another file pointer for input from the terminal (if <i>type</i> is <code>NULL</code>, <code>\$TERM</code> will be used). The program must also call <code>endwin()</code> for each terminal being used before exiting from curses. If <code>newterm()</code> is called more than once for the same terminal, the first terminal referred to must be the last one for which <code>endwin()</code> is called.</p> <p>A program should always call <code>endwin()</code> before exiting or escaping from curses mode temporarily. This routine restores tty modes, moves the cursor to the lower left-hand corner of the screen and resets the terminal into the proper non-visual mode. Calling <code>refresh()</code> or <code>doupdate()</code> after a temporary escape causes the program to resume visual mode.</p> <p>The <code>isendwin()</code> routine returns <code>TRUE</code> if <code>endwin()</code> has been called without any subsequent calls to <code>wrefresh()</code>, and <code>FALSE</code> otherwise.</p>

`curs_initscr(3CURSES)`

The `set_term()` routine is used to switch between different terminals. The screen reference `new` becomes the new current terminal. The previous terminal is returned by the routine. This is the only routine which manipulates `SCREEN` pointers; all other routines affect only the current terminal.

The `delscreen()` routine frees storage associated with the `SCREEN` data structure. The `endwin()` routine does not do this, so `delscreen()` should be called after `endwin()` if a particular `SCREEN` is no longer needed.

RETURN VALUES `endwin()` returns the integer `ERR` upon failure and `OK` upon successful completion.

Routines that return pointers always return `NULL` on error.

ATTRIBUTES See `attributes(5)` for descriptions of the following attributes:

ATTRIBUTE TYPE	ATTRIBUTE VALUE
MT-Level	Unsafe

SEE ALSO `curs_kernel(3CURSES)`, `curs_refresh(3CURSES)`, `curs_slk(3CURSES)`, `curs_util(3CURSES)`, `curses(3CURSES)`, `attributes(5)`

NOTES The header `<curses.h>` automatically includes the headers `<stdio.h>` and `<unctrl.h>`.

Note that `initscr()` and `newterm()` may be macros.

curs_inopts(3CURSES)

NAME	curs_inopts, cbreak, nocbreak, echo, noecho, halfdelay, intrflush, keypad, meta, nodelay, notimeout, raw, noraw, noqiflush, qiflush, timeout, wtimeout, typeahead – curses terminal input option control routines
SYNOPSIS	<pre>cc [<i>flag</i> ...] <i>file</i> ... -lcurses [<i>library</i> ...] #include <curses.h> int cbreak(void); int nocbreak(void); int echo(void); int noecho(void); int halfdelay(int <i>tenths</i>); int intrflush(WINDOW *<i>win</i>, bool <i>bf</i>); int keypad(WINDOW *<i>win</i>, bool <i>bf</i>); int meta(WINDOW *<i>win</i>, bool <i>bf</i>); int nodelay(WINDOW *<i>win</i>, bool <i>bf</i>); int notimeout(WINDOW *<i>win</i>, bool <i>bf</i>); int raw(void); int noraw(void); void noqiflush(void); void qiflush(void); void timeout(int <i>delay</i>); void wtimeout(WINDOW *<i>win</i>, int <i>delay</i>); int typeahead(int <i>fildes</i>);</pre>
DESCRIPTION	<p>The <code>cbreak()</code> and <code>nocbreak()</code> routines put the terminal into and out of <code>cbreak()</code> mode, respectively. In this mode, characters typed by the user are immediately available to the program, and erase/kill character-processing is not performed. When out of this mode, the tty driver buffers the typed characters until a newline or carriage return is typed. Interrupt and flow control characters are unaffected by this mode. Initially the terminal may or may not be in <code>cbreak()</code> mode, as the mode is inherited; therefore, a program should call <code>cbreak()</code> or <code>nocbreak()</code> explicitly. Most interactive programs using <code>curses</code> set the <code>cbreak()</code> mode.</p> <p>Note that <code>cbreak()</code> overrides <code>raw()</code>. (See <code>curs_getch(3CURSES)</code> for a discussion of how these routines interact with <code>echo()</code> and <code>noecho()</code>.)</p> <p>The <code>echo()</code> and <code>noecho()</code> routines control whether characters typed by the user are echoed by <code>getch()</code> as they are typed. Echoing by the tty driver is always disabled, but initially <code>getch()</code> is in <code>echo</code> mode, so characters typed are echoed. Authors of</p>

most interactive programs prefer to do their own echoing in a controlled area of the screen, or not to echo at all, so they disable echoing by calling `noecho()`. (See `curs_getch(3CURSES)` for a discussion of how these routines interact with `cbreak()` and `nocbreak()`.)

The `halfdelay()` routine is used for half-delay mode, which is similar to `cbreak()` mode in that characters typed by the user are immediately available to the program. However, after blocking for *tenths* tenths of seconds, `ERR` is returned if nothing has been typed. The value of *tenths* must be a number between 1 and 255. Use `nocbreak()` to leave half-delay mode.

If the `intrflush()` option is enabled, (*bf* is `TRUE`), when an interrupt key is pressed on the keyboard (interrupt, break, quit) all output in the tty driver queue will be flushed, giving the effect of faster response to the interrupt, but causing `curses` to have the wrong idea of what is on the screen. Disabling (*bf* is `FALSE`), the option prevents the flush. The default for the option is inherited from the tty driver settings. The window argument is ignored.

The `keypad()` option enables the keypad of the user's terminal. If enabled (*bf* is `TRUE`), the user can press a function key (such as an arrow key) and `wgetch()` returns a single value representing the function key, as in `KEY_LEFT`. If disabled (*bf* is `FALSE`), `curses` does not treat function keys specially and the program has to interpret the escape sequences itself. If the keypad in the terminal can be turned on (made to transmit) and off (made to work locally), turning on this option causes the terminal keypad to be turned on when `wgetch()` is called. The default value for keypad is false.

Initially, whether the terminal returns 7 or 8 significant bits on input depends on the control mode of the tty driver (see `termio(7I)`). To force 8 bits to be returned, invoke `meta(win, TRUE)`. To force 7 bits to be returned, invoke `meta(win, FALSE)`. The window argument, *win*, is always ignored. If the terminfo capabilities `smm` (`meta_on`) and `rmm` (`meta_off`) are defined for the terminal, `smm` is sent to the terminal when `meta(win, TRUE)` is called and `rmm` is sent when `meta(win, FALSE)` is called.

The `nodelay()` option causes `getch()` to be a non-blocking call. If no input is ready, `getch()` returns `ERR`. If disabled (*bf* is `FALSE`), `getch()` waits until a key is pressed.

While interpreting an input escape sequence, `wgetch()` sets a timer while waiting for the next character. If `notimeout(win, TRUE)` is called, then `wgetch()` does not set a timer. The purpose of the timeout is to differentiate between sequences received from a function key and those typed by a user.

With the `raw()` and `noraw()` routines, the terminal is placed into or out of raw mode. Raw mode is similar to `cbreak()` mode, in that characters typed are immediately passed through to the user program. The differences are that in raw mode, the interrupt, quit, suspend, and flow control characters are all passed through uninterpreted, instead of generating a signal. The behavior of the `BREAK` key depends on other bits in the tty driver that are not set by `curses`.

curs_inopts(3CURSES)

When the `noqiflush()` routine is used, normal flush of input and output queues associated with the `INTR`, `QUIT` and `SUSP` characters will not be done (see `termio(7I)`). When `qiflush()` is called, the queues will be flushed when these control characters are read.

The `timeout()` and `wtimeout()` routines set blocking or non-blocking read for a given window. If *delay* is negative, blocking read is used (that is, waits indefinitely for input). If *delay* is zero, then non-blocking read is used (that is, read returns `ERR` if no input is waiting). If *delay* is positive, then read blocks for *delay* milliseconds, and returns `ERR` if there is still no input. Hence, these routines provide the same functionality as `nodelay()`, plus the additional capability of being able to block for only *delay* milliseconds (where *delay* is positive).

`curses` does "line-breakout optimization" by looking for typeahead periodically while updating the screen. If input is found, and it is coming from a tty, the current update is postponed until `refresh()` or `doupdate()` is called again. This allows faster response to commands typed in advance. Normally, the input FILE pointer passed to `newterm()`, or `stdin` in the case that `initscr()` was used, will be used to do this typeahead checking. The `typeahead()` routine specifies that the file descriptor *fildev* is to be used to check for typeahead instead. If *fildev* is `-1`, then no typeahead checking is done.

RETURN VALUES

All routines that return an integer return `ERR` upon failure and an integer value other than `ERR` upon successful completion, unless otherwise noted in the preceding routine descriptions.

ATTRIBUTES

See `attributes(5)` for descriptions of the following attributes:

ATTRIBUTE TYPE	ATTRIBUTE VALUE
MT-Level	Unsafe

SEE ALSO

`curs_getch(3CURSES)`, `curs_initscr(3CURSES)`, `curses(3CURSES)`, `attributes(5)`, `termio(7I)`

NOTES

The header `<curses.h>` automatically includes the headers `<stdio.h>` and `<unctrl.h>`.

Note that `echo()`, `noecho()`, `halfdelay()`, `intrflush()`, `meta()`, `nodelay()`, `notimeout()`, `noqiflush()`, `qiflush()`, `timeout()`, and `wtimeout()` may be macros.

NAME curs_insch, insch, winsch, mvinsch, mvwinsch – insert a character before the character under the cursor in a curses window

SYNOPSIS

```
cc [ flag ... ] file... -lcurses [ library ... ]
#include <curses.h>

int insch(chtype ch);
int winsch(WINDOW *win, chtype ch);
int mvinsch(int y, int x, chtype ch);
int mvwinsch(WINDOW *win, int y, int x, chtype ch);
```

DESCRIPTION With these routines, the character *ch* is inserted before the character under the cursor. All characters to the right of the cursor are moved one space to the right, with the possibility of the rightmost character on the line being lost. The cursor position does not change (after moving to *y*, *x*, if specified). (This does not imply use of the hardware insert character feature.)

RETURN VALUES All routines return the integer ERR upon failure and an integer value other than ERR upon successful completion.

ATTRIBUTES See attributes(5) for descriptions of the following attributes:

ATTRIBUTE TYPE	ATTRIBUTE VALUE
MT-Level	Unsafe

SEE ALSO curses(3CURSES), attributes(5)

NOTES The header <curses.h> automatically includes the headers <stdio.h> and <unctrl.h>.

Note that insch(), mvinsch(), and mvwinsch() may be macros.

`curs_ insstr(3CURSES)`

NAME `curs_ insstr, insstr, insnstr, winsstr, winsnstr, mvinsstr, mvinsnstr, mvwinsstr, mvwinsnstr` – insert string before character under the cursor in a curses window

SYNOPSIS

```
cc [ flag ... ] file ... -lcurses [ library ... ]
#include <curses.h>

int insstr(char *str);
int insnstr(char *str, int n);
int winsstr(WINDOW *win, char *str);
int winsnstr(WINDOW *win, char *str, int n);
int mvinsstr(int y, int x, char *str);
int mvinsnstr(int y, int x, char *str, int n);
int mvwinsstr(WINDOW *win, int y, int x, char *str);
int mvwinsnstr(WINDOW *win, int y, int x, char *str, int n);
```

DESCRIPTION With these routines, a character string (as many characters as will fit on the line) is inserted before the character under the cursor. All characters to the right of the cursor are moved to the right, with the possibility of the rightmost characters on the line being lost. The cursor position does not change (after moving to *y, x*, if specified). (This does not imply use of the hardware insert character feature.) The four routines with *n* as the last argument insert at most *n* characters. If *n* ≤ 0, then the entire string is inserted.

If a character in *str* is a tab, newline, carriage return or backspace, the cursor is moved appropriately within the window. A newline also does a `clrtoeol()` before moving. Tabs are considered to be at every eighth column. If a character in *str* is another control character, it is drawn in the `^X` notation. Calling `winch()` after adding a control character (and moving to it, if necessary) does not return the control character, but instead returns the representation of the control character.

RETURN VALUES All routines return the integer `ERR` upon failure and an integer value other than `ERR` upon successful completion.

ATTRIBUTES See `attributes(5)` for descriptions of the following attributes:

ATTRIBUTE TYPE	ATTRIBUTE VALUE
MT-Level	Unsafe

SEE ALSO `curs_ clear(3CURSES), curs_ inch(3CURSES), curses(3CURSES), attributes(5)`

NOTES The header `<curses.h>` automatically includes the headers `<stdio.h>` and `<unctrl.h>`.

`curs_ insstr(3CURSES)`

Note that all but `winsnstr()` may be macros.

curs_instr(3CURSES)

NAME	<code>curs_instr</code> , <code>instr</code> , <code>innstr</code> , <code>winstr</code> , <code>winnstr</code> , <code>mvinstr</code> , <code>mvinnstr</code> , <code>mvwinstr</code> , <code>mvwinnstr</code> – get a string of characters from a curses window				
SYNOPSIS	<pre>cc [<i>flag</i> ...] <i>file</i> ... -lcurses [<i>library</i> ...] #include <curses.h> int instr(char *<i>str</i>); int innstr(char *<i>str</i>, int <i>n</i>); int winstr(WINDOW *<i>win</i>, char *<i>str</i>); int winnstr(WINDOW *<i>win</i>, char *<i>str</i>, int <i>n</i>); int mvinstr(int <i>y</i>, int <i>x</i>, char *<i>str</i>); int mvinnstr(int <i>y</i>, int <i>x</i>, char *<i>str</i>, int <i>n</i>); int mvwinstr(WINDOW *<i>win</i>, int <i>y</i>, int <i>x</i>, char *<i>str</i>); int mvwinnstr(WINDOW *<i>win</i>, int <i>y</i>, int <i>x</i>, char *<i>str</i>, int <i>n</i>);</pre>				
DESCRIPTION	These routines return a string of characters in <i>str</i> , starting at the current cursor position in the named window and ending at the right margin of the window. Attributes are stripped from the characters. The four functions with <i>n</i> as the last argument return the string at most <i>n</i> characters long.				
RETURN VALUES	All routines return the integer ERR upon failure and an integer value other than ERR upon successful completion.				
ATTRIBUTES	See <code>attributes(5)</code> for descriptions of the following attributes:				
	<table border="1"><thead><tr><th>ATTRIBUTE TYPE</th><th>ATTRIBUTE VALUE</th></tr></thead><tbody><tr><td>MT-Level</td><td>Unsafe</td></tr></tbody></table>	ATTRIBUTE TYPE	ATTRIBUTE VALUE	MT-Level	Unsafe
ATTRIBUTE TYPE	ATTRIBUTE VALUE				
MT-Level	Unsafe				
SEE ALSO	<code>curses(3CURSES)</code> , <code>attributes(5)</code>				
NOTES	The header <code><curses.h></code> automatically includes the headers <code><stdio.h></code> and <code><unctrl.h></code> . Note that all routines except <code>winnstr()</code> may be macros.				

NAME | curs_inswch, inswch, winswch, mvinswch, mvwinswch – insert a wchar_t character before the character under the cursor in a curses window

SYNOPSIS | `cc [flag ...] file ... -lcurses [library ..]`
`#include <curses.h>`

```
int inswch(chtype wch);
int winswch(WINDOW *win, chtype wch);
int mvinswch(int y, int x, chtype wch);
int mvwinswch(WINDOW *win, int y, int x, chtype wch);
```

DESCRIPTION | These routines insert the character *wch*, holding a wchar_t character, before the character under the cursor. All characters to the right of the cursor are moved one space to the right, with the possibility of the rightmost character on the line being lost. The cursor position does not change (after moving to *y*, *x*, if specified). (This does not imply use of the hardware insert character feature.)

RETURN VALUE | All routines return the integer ERR upon failure and an integer value other than ERR upon successful completion.

ATTRIBUTES | See attributes(5) for descriptions of the following attributes:

ATTRIBUTE TYPE	ATTRIBUTE VALUE
MT-Level	Unsafe

SEE ALSO | curses(3CURSES), attributes(5)

NOTES | The header file <curses.h> automatically includes the header files <stdio.h>, <unctrl.h> and <widec.h>.

Note that inswch(), mvinswch(), and mvwinswch() may be macros.

None of these routines can use the color attribute in chtype.

curs_inswstr(3CURSES)

NAME	curs_inswstr, inswstr, insnwstr, winswstr, winsnwstr, mvinswstr, mvinsnwstr, mvwinswstr, mvwinsnwstr – insert wchar_t string before character under the cursor in a curses window				
SYNOPSIS	<pre>cc [flag ...] file ... -lcurses [library ..] #include <curses.h> int inswstr(wchar_t *wstr); int insnwstr(wchar_t *wstr, int n); int winswstr(WINDOW *win, wchar_t *wstr); int winsnwstr(WINDOW *win, wchar_t *wstr, int n); int mvinswstr(int y, int x, wchar_t *wstr); int mvinsnwstr(int y, int x, wchar_t *wstr, int n); int mvwinswstr(WINDOW *win, int y, int x, wchar_t *wstr); int mvwinsnwstr(WINDOW *win, int y, int x, wchar_t *wstr, int n);</pre>				
DESCRIPTION	<p>These routines insert a wchar_t character string (as many wchar_t characters as will fit on the line) before the character under the cursor. All characters to the right of the cursor are moved to the right, with the possibility of the rightmost characters on the line being lost. The cursor position does not change (after moving to y, x, if specified). (This does not imply use of the hardware insert character feature.) The four routines with n as the last argument insert at most n wchar_t characters. If n<=0, then the entire string is inserted.</p> <p>If a character in wstr is a tab, newline, carriage return, or backspace, the cursor is moved appropriately within the window. A newline also does a clrtoeol(3CURSES) before moving. Tabs are considered to be at every eighth column. If a character in wstr is another control character, it is drawn in the ^X notation. Calling winwch(3CURSES) after adding a control character (and moving to it, if necessary) does not return the control character, but instead returns the representation of the control character.</p>				
RETURN VALUE	All routines return the integer ERR upon failure and an integer value other than ERR upon successful completion.				
ATTRIBUTES	See attributes(5) for descriptions of the following attributes:				
	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">ATTRIBUTE TYPE</th> <th style="text-align: center;">ATTRIBUTE VALUE</th> </tr> </thead> <tbody> <tr> <td>MT-Level</td> <td>Unsafe</td> </tr> </tbody> </table>	ATTRIBUTE TYPE	ATTRIBUTE VALUE	MT-Level	Unsafe
ATTRIBUTE TYPE	ATTRIBUTE VALUE				
MT-Level	Unsafe				
SEE ALSO	clrtoeol(3CURSES), curses(3CURSES), winwch(3CURSES), attributes(5)				
NOTES	The header file <curses.h> automatically includes the header files <stdio.h>, <unctrl.h> and <widec.h>.				

`curs_inswstr(3CURSES)`

Note that all but `winswstr()` may be macros.

curs_inwch(3CURSES)

NAME	curs_inwch, inwch, winwch, mvwinch, mvwinwch – get a wchar_t character and its attributes from a curses window				
SYNOPSIS	<pre>cc [flag ...] file ... -lcurses [library ..] #include <curses.h> ctype inwch(void); ctype winwch(WINDOW *win); ctype mvwinch(int y, int x); ctype mvwinwch(WINDOW *win, int y, int x);</pre>				
DESCRIPTION	These routines return the wchar_t character, of type ctype, at the current position in the named window. If any attributes are set for that position, their values are OR-ed into the value returned. Constants defined in <curses.h> can be used with the logical AND (&) operator to extract the character or attributes alone.				
Attributes	The following bit-masks may be AND-ed with characters returned by winwch(). A_WCHARTEXT Bit-mask to extract character A_WATTRIBUTES Bit-mask to extract attributes				
ATTRIBUTES	See attributes(5) for descriptions of the following attributes: <table border="1"><thead><tr><th>ATTRIBUTE TYPE</th><th>ATTRIBUTE VALUE</th></tr></thead><tbody><tr><td>MT-Level</td><td>Unsafe</td></tr></tbody></table>	ATTRIBUTE TYPE	ATTRIBUTE VALUE	MT-Level	Unsafe
ATTRIBUTE TYPE	ATTRIBUTE VALUE				
MT-Level	Unsafe				
SEE ALSO	curses(3CURSES), attributes(5)				
NOTES	The header file <curses.h> automatically includes the header files <stdio.h>, <unctrl.h> and <wdec.h>. Note that all of these routines may be macros. None of these routines can use the color attribute in ctype.				

NAME | curs_inwchstr, inwchstr, inwchnstr, winwchstr, winwchnstr, mvinwchstr, mvinwchnstr, mvwinwchstr, mvwinwchnstr – get a string of wchar_t characters (and attributes) from a curses window

SYNOPSIS |

```
cc [ flag ... ] file ... -lcurses [ library .. ]
#include <curses.h>

int inwchstr(chtype *wchstr);
int inwchnstr(chtype *wchstr, int n);
int winwchstr(WINDOW *win, chtype *wchstr);
int winwchnstr(WINDOW *win, chtype *wchstr, int n);
int mvinwchstr(int y, int x, chtype *wchstr);
int mvinwchnstr(int y, int x, chtype *wchstr, int n);
int mvwinwchstr(WINDOW *win, int y, int x, chtype *wchstr);
int mvwinwchnstr(WINDOW *win, int y, int x, chtype *wchstr, int n);
```

DESCRIPTION | These routines return a string of type chtype, holding wchar_t characters, starting at the current cursor position in the named window and ending at the right margin of the window. The four functions with *n* as the last argument, return the string at most *n* wchar_t characters long. Constants defined in <curses.h> can be used with the logical AND (&) operator to extract the wchar_t character or the attribute alone from any position in the *wchstr* (see curs_inwch(3CURSES)).

RETURN VALUE | All routines return the integer ERR upon failure and an integer value other than ERR upon successful completion.

ATTRIBUTES | See attributes(5) for a description of the following attributes:

ATTRIBUTE TYPE	ATTRIBUTE VALUE
MT-Level	Unsafe

SEE ALSO | curses(3CURSES), curs_inwch(3CURSES), attributes(5)

NOTES | The header file <curses.h> automatically includes the header files <stdio.h>, <unctrl.h> and <widec.h>.

Note that all routines except winwchnstr() may be macros.

None of these routines can use the color attribute in chtype.

curs_inwstr(3CURSES)

NAME	<code>curs_inwstr</code> , <code>inwstr</code> , <code>innwstr</code> , <code>winwstr</code> , <code>winnwstr</code> , <code>mvinwstr</code> , <code>mvinnwstr</code> , <code>mvwinwstr</code> , <code>mvwinnwstr</code> – get a string of <code>wchar_t</code> characters from a curses window				
SYNOPSIS	<pre>cc [flag ...] file ... -lcurses[library ..] #include <curses.h> int inwstr(wchar_t *wstr); int innwstr(wchar_t *wstr, int n); int winwstr(WINDOW *win, wchar_t *wstr); int winnwstr(WINDOW *win, wchar_t *wstr, int n); int mvinwstr(int y, int x, wchar_t *wstr); int mvinnwstr(int y, int x, wchar_t *wstr, int n); int mvwinwstr(WINDOW *win, int y, int x, wchar_t *wstr); int mvwinnwstr(WINDOW *win, int y, int x, wchar_t *wstr, int n);</pre>				
DESCRIPTION	These routines return the string of <code>wchar_t</code> characters in <code>wstr</code> starting at the current cursor position in the named window and ending at the right margin of the window. Attributes are stripped from the characters. The four functions with <code>n</code> as the last argument return the string at most <code>n</code> <code>wchar_t</code> characters long.				
RETURN VALUES	All routines return the integer <code>ERR</code> upon failure and an integer value other than <code>ERR</code> upon successful completion.				
ATTRIBUTES	See <code>attributes(5)</code> for descriptions of the following attributes:				
	<table border="1"><thead><tr><th>ATTRIBUTE TYPE</th><th>ATTRIBUTE VALUE</th></tr></thead><tbody><tr><td>MT-Level</td><td>Unsafe</td></tr></tbody></table>	ATTRIBUTE TYPE	ATTRIBUTE VALUE	MT-Level	Unsafe
ATTRIBUTE TYPE	ATTRIBUTE VALUE				
MT-Level	Unsafe				
SEE ALSO	<code>curses(3CURSES)</code> , <code>attributes(5)</code>				
NOTES	The header file <code><curses.h></code> automatically includes the header files <code><stdio.h></code> , <code><unctrl.h></code> and <code><wider.h></code> . Note that all routines except <code>winnwstr()</code> may be macros.				

NAME	curs_kernel, def_prog_mode, def_shell_mode, reset_prog_mode, reset_shell_mode, resetty, savetty, getsyx, setsyx, ripoffline, curs_set, napms – low-level curses routines
SYNOPSIS	<pre>cc [flag ...] file ... -lcurses [library ...] #include <curses.h> int def_prog_mode(void); int def_shell_mode(void); int reset_prog_mode(void); int reset_shell_mode(void); int resetty(void); int savetty(void); int getsyx(int y, int x); int setsyx(int y, int x); int ripoffline(int line, int (*init)(WINDOW *, int)); int curs_set(int visibility); int napms(int ms);</pre>
DESCRIPTION	<p>The following routines give low-level access to various curses functionality. These routines typically are used inside library routines.</p> <p>The <code>def_prog_mode()</code> and <code>def_shell_mode()</code> routines save the current terminal modes as the “program” (in curses) or “shell” (not in curses) state for use by the <code>reset_prog_mode()</code> and <code>reset_shell_mode()</code> routines. This is done automatically by <code>initscr()</code>.</p> <p>The <code>reset_prog_mode()</code> and <code>reset_shell_mode()</code> routines restore the terminal to “program” (in curses) or “shell” (out of curses) state. These are done automatically by <code>endwin()</code> and, after an <code>endwin()</code>, by <code>doupdate()</code>, so they normally are not called.</p> <p>The <code>resetty()</code> and <code>savetty()</code> routines save and restore the state of the terminal modes. <code>savetty()</code> saves the current state in a buffer and <code>resetty()</code> restores the state to what it was at the last call to <code>savetty()</code>.</p> <p>With the <code>getsyx()</code> routine, the current coordinates of the virtual screen cursor are returned in <code>y</code> and <code>x</code>. If <code>leaveok()</code> is currently TRUE, then <code>-1,-1</code> is returned. If lines have been removed from the top of the screen, using <code>ripoffline()</code>, <code>y</code> and <code>x</code> include these lines; therefore, <code>y</code> and <code>x</code> should be used only as arguments for <code>setsyx()</code>.</p> <p>With the <code>setsyx()</code> routine, the virtual screen cursor is set to <code>y, x</code>. If <code>y</code> and <code>x</code> are both <code>-1</code>, then <code>leaveok()</code> is set. The two routines <code>getsyx()</code> and <code>setsyx()</code> are designed to be used by a library routine, which manipulates curses windows but does not</p>

curs_kernel(3CURSES)

want to change the current position of the program's cursor. The library routine would call `getsyx()` at the beginning, do its manipulation of its own windows, do a `wnoutrefresh()` on its windows, call `setsyx()`, and then call `doupdate()`.

The `riporffline()` routine provides access to the same facility that `slk_init()` (see `curs_slk(3CURSES)`) uses to reduce the size of the screen. `riporffline()` must be called before `initscr()` or `newterm()` is called. If `line` is positive, a line is removed from the top of `stdscr()`; if `line` is negative, a line is removed from the bottom. When this is done inside `initscr()`, the routine `init()` (supplied by the user) is called with two arguments: a window pointer to the one-line window that has been allocated and an integer with the number of columns in the window. Inside this initialization routine, the integer variables `LINES` and `COLS` (defined in `< curses.h >`) are not guaranteed to be accurate and `wrefresh()` or `doupdate()` must not be called. It is allowable to call `wnoutrefresh()` during the initialization routine.

`riporffline()` can be called up to five times before calling `initscr()` or `newterm()`.

With the `curs_set()` routine, the cursor state is set to invisible, normal, or very visible for *visibility* equal to 0, 1, or 2 respectively. If the terminal supports the *visibility* requested, the previous *cursor* state is returned; otherwise, `ERR` is returned.

The `napms()` routine is used to sleep for *ms* milliseconds.

RETURN VALUES

Except for `curs_set()`, these routines always return `OK`. `curs_set()` returns the previous cursor state, or `ERR` if the requested *visibility* is not supported.

ATTRIBUTES

See `attributes(5)` for descriptions of the following attributes:

ATTRIBUTE TYPE	ATTRIBUTE VALUE
MT-Level	Unsafe

SEE ALSO

`curs_initscr(3CURSES)`, `curs_outopts(3CURSES)`, `curs_refresh(3CURSES)`, `curs_scr_dump(3CURSES)`, `curs_slk(3CURSES)`, `curses(3CURSES)`, `attributes(5)`

NOTES

The header `< curses.h >` automatically includes the headers `< stdio.h >` and `< unctrl.h >`.

Note that `getsyx()` is a macro, so an ampersand (&) is not necessary before the variables *y* and *x*.

NAME | curs_move, move, wmove – move curses window cursor

SYNOPSIS |

```
cc [ flag ... ] file ... -lcurses [ library ... ]
#include <curses.h>

int move(int y, int x);
int wmove(WINDOW *win, int y, int x);
```

DESCRIPTION | With these routines, the cursor associated with the window is moved to line *y* and column *x*. This routine does not move the physical cursor of the terminal until `refresh()` is called. The position specified is relative to the upper left-hand corner of the window, which is (0,0).

RETURN VALUES | These routines return the integer `ERR` upon failure and an integer value other than `ERR` upon successful completion.

ATTRIBUTES | See `attributes(5)` for descriptions of the following attributes:

ATTRIBUTE TYPE	ATTRIBUTE VALUE
MT-Level	Unsafe

SEE ALSO | `curs_refresh(3CURSES)`, `curses(3CURSES)`, `attributes(5)`

NOTES | The header `<curses.h>` automatically includes the headers `<stdio.h>` and `<unctrl.h>`.

Note that `move()` may be a macro.

curs_ouptopts(3CURSES)

NAME	<code>curs_ouptopts</code> , <code>clearok</code> , <code>idlok</code> , <code>idcok</code> , <code>immedok</code> , <code>leaveok</code> , <code>setscrreg</code> , <code>wsetscrreg</code> , <code>scrollok</code> , <code>nl</code> , <code>nonl</code> – curses terminal output option control routines
SYNOPSIS	<pre>cc [flag ...] file ... -lcurses [library ...] #include <curses.h> int clearok(WINDOW *win, bool bf); int idlok(WINDOW *win, bool bf); void idcok(WINDOW *win, bool bf); void immedok(WINDOW *win, bool bf); int leaveok(WINDOW *win, bool bf); int setscrreg(int top, int bot); int wsetscrreg(WINDOW *win, int top, int bot); int scrollok(WINDOW *win, bool bf); int nl(void); int nonl(void);</pre>
DESCRIPTION	<p>These routines set options that deal with output within curses. All options are initially FALSE, unless otherwise stated. It is not necessary to turn these options off before calling <code>endwin()</code>.</p> <p>With the <code>clearok()</code> routine, if enabled (<i>bf</i> is TRUE), the next call to <code>wrefresh()</code> with this window will clear the screen completely and redraw the entire screen from scratch. This is useful when the contents of the screen are uncertain, or in some cases for a more pleasing visual effect. If the <i>win</i> argument to <code>clearok()</code> is the global variable <code>curscr()</code>, the next call to <code>wrefresh()</code> with any window causes the screen to be cleared and repainted from scratch.</p> <p>With the <code>idlok()</code> routine, if enabled (<i>bf</i> is TRUE), curses considers using the hardware insert/delete line feature of terminals so equipped. If disabled (<i>bf</i> is FALSE), curses very seldom uses this feature. (The insert/delete character feature is always considered.) This option should be enabled only if the application needs insert/delete line, for example, for a screen editor. It is disabled by default because insert/delete line tends to be visually annoying when used in applications where it isn't really needed. If insert/delete line cannot be used, curses redraws the changed portions of all lines.</p> <p>With the <code>idcok()</code> routine, if enabled (<i>bf</i> is TRUE), curses considers using the hardware insert/delete character feature of terminals so equipped. This is enabled by default.</p> <p>With the <code>immedok()</code> routine, if enabled (<i>bf</i> is TRUE), any change in the window image, such as the ones caused by <code>waddch()</code>, <code>wclrtoobot()</code>, <code>wscrl()</code>, etc., automatically cause a call to <code>wrefresh()</code>. However, it may degrade the performance considerably, due to repeated calls to <code>wrefresh()</code>. It is disabled by default.</p>

Normally, the hardware cursor is left at the location of the window cursor being refreshed. The `leaveok()` option allows the cursor to be left wherever the update happens to leave it. It is useful for applications where the cursor is not used, since it reduces the need for cursor motions. If possible, the cursor is made invisible when this option is enabled.

The `setscrreg()` and `wsetscrreg()` routines allow the application programmer to set a software scrolling region in a window. *top* and *bot* are the line numbers of the top and bottom margin of the scrolling region. (Line 0 is the top line of the window.) If this option and `scrollok()` are enabled, an attempt to move off the bottom margin line causes all lines in the scrolling region to scroll up one line. Only the text of the window is scrolled. (Note that this has nothing to do with the use of a physical scrolling region capability in the terminal, like that in the VT100. If `idlok()` is enabled and the terminal has either a scrolling region or insert/delete line capability, they will probably be used by the output routines.)

The `scrollok()` option controls what happens when the cursor of a window is moved off the edge of the window or scrolling region, either as a result of a newline action on the bottom line, or typing the last character of the last line. If disabled, (*bf* is FALSE), the cursor is left on the bottom line. If enabled, (*bf* is TRUE), `wrefresh()` is called on the window, and the physical terminal and window are scrolled up one line. (Note that in order to get the physical scrolling effect on the terminal, it is also necessary to call `idlok()`.)

The `nl()` and `nonl()` routines control whether newline is translated into carriage return and linefeed on output, and whether return is translated into newline on input. Initially, the translations do occur. By disabling these translations using `nonl()`, `curses` is able to make better use of the linefeed capability, resulting in faster cursor motion.

RETURN VALUES `setscrreg()` and `wsetscrreg()` return OK upon success and ERR upon failure. All other routines that return an integer always return OK.

ATTRIBUTES See `attributes(5)` for descriptions of the following attributes:

ATTRIBUTE TYPE	ATTRIBUTE VALUE
MT-Level	Unsafe

SEE ALSO `curs_addch(3CURSES)`, `curs_clear(3CURSES)`, `curs_initscr(3CURSES)`, `curs_refresh(3CURSES)`, `curs_scroll(3CURSES)`, `curses(3CURSES)`, `attributes(5)`

NOTES The header `<curses.h>` automatically includes the headers `<stdio.h>` and `<unctrl.h>`.

Note that `clearok()`, `leaveok()`, `scrollok()`, `idcok()`, `nl()`, `nonl()`, and `setscrreg()` may be macros.

`curs_outopts(3CURSES)`

The `immedok()` routine is useful for windows that are used as terminal emulators.

NAME curs_overlay, overlay, overwrite, copywin – overlap and manipulate overlapped curses windows

SYNOPSIS

```
cc [ flag ... ] file ... -lcurses [ library ... ]
#include <curses.h>

int overlay(WINDOW *srcwin, WINDOW *dstwin);
int overwrite(WINDOW *srcwin, WINDOW *dstwin);
int copywin(WINDOW *srcwin, WINDOW *dstwin, int sminrow, int smincol,
            int dminrow, int dmincol, int dmaxrow, int dmaxcol, int overlay);
```

DESCRIPTION

The overlay() and overwrite() routines overlay *srcwin* on top of *dstwin*. *srcwin* and *dstwin* are not required to be the same size; only text where the two windows overlap is copied. The difference is that overlay() is non-destructive (blanks are not copied) whereas overwrite() is destructive.

The copywin() routine provides a finer granularity of control over the overlay() and overwrite() routines. Like in the refresh() routine, a rectangle is specified in the destination window, (*dminrow*, *dmincol*) and (*dmaxrow*, *dmaxcol*), and the upper-left-corner coordinates of the source window, (*sminrow*, *smincol*). If the argument *overlay* is true, then copying is non-destructive, as in overlay().

RETURN VALUES Routines that return an integer return ERR upon failure and an integer value other than ERR upon successful completion.

ATTRIBUTES See attributes(5) for descriptions of the following attributes:

ATTRIBUTE TYPE	ATTRIBUTE VALUE
MT-Level	Unsafe

SEE ALSO curs_pad(3CURSES), curs_refresh(3CURSES), curses(3CURSES), attributes(5)

NOTES The header <curses.h> automatically includes the headers <stdio.h> and <unctrl.h>.

Note that overlay() and overwrite may be macros.

curs_pad(3CURSES)

NAME	<code>curs_pad</code> , <code>newpad</code> , <code>subpad</code> , <code>prefresh</code> , <code>pnoutrefresh</code> , <code>pechochar</code> , <code>pechowchar</code> – create and display curses pads
SYNOPSIS	<pre>cc [flag ...] file ... -lcurses [library ..] #include <curses.h> WINDOW *newpad(int nlines, int ncols); WINDOW *subpad(WINDOW *orig, int nlines, int ncols, int begin_y, int begin_x); int prefresh(WINDOW *pad, int pminrow, int pmincol, int sminrow, int smincol, int smaxrow, int smaxcol); int pnoutrefresh(WINDOW *pad, int pminrow, int pmincol, int sminrow, int smincol, int smaxrow, int smaxcol); int pechochar(WINDOW *pad, chtype ch); int pechowchar(WINDOW *pad, chtype wch);</pre>
DESCRIPTION	<p>The <code>newpad()</code> routine creates and returns a pointer to a new pad data structure with the given number of lines, <i>nlines</i>, and columns, <i>ncols</i>. A pad is like a window, except that it is not restricted by the screen size, and is not necessarily associated with a particular part of the screen. Pads can be used when a large window is needed, and only a part of the window will be on the screen at one time. Automatic refreshes of pads (for example, from scrolling or echoing of input) do not occur. It is not legal to call <code>wrefresh(3CURSES)</code> with a <i>pad</i> as an argument; the routines <code>prefresh()</code> or <code>pnoutrefresh()</code> should be called instead. Note that these routines require additional parameters to specify the part of the pad to be displayed and the location on the screen to be used for the display.</p> <p>The <code>subpad()</code> routine creates and returns a pointer to a subwindow within a pad with the given number of lines, <i>nlines</i>, and columns, <i>ncols</i>. Unlike <code>subwin(3CURSES)</code>, which uses screen coordinates, the window is at position (<i>begin_x</i>, <i>begin_y</i>) on the pad. The window is made in the middle of the window <i>orig</i>, so that changes made to one window affect both windows. During the use of this routine, it will often be necessary to call <code>touchwin(3CURSES)</code> or <code>touchline(3CURSES)</code> on <i>orig</i> before calling <code>prefresh()</code>.</p> <p>The <code>prefresh()</code> and <code>pnoutrefresh()</code> routines are analogous to <code>wrefresh(3CURSES)</code> and <code>wnoutrefresh(3CURSES)</code> except that they relate to pads instead of windows. The additional parameters are needed to indicate what part of the pad and screen are involved. <i>pminrow</i> and <i>pmincol</i> specify the upper left-hand corner of the rectangle to be displayed in the pad. <i>sminrow</i>, <i>smincol</i>, <i>smaxrow</i>, and <i>smaxcol</i> specify the edges of the rectangle to be displayed on the screen. The lower right-hand corner of the rectangle to be displayed in the pad is calculated from the screen coordinates, since the rectangles must be the same size. Both rectangles must be entirely contained within their respective structures. Negative values of <i>pminrow</i>, <i>pmincol</i>, <i>sminrow</i>, or <i>smincol</i> are treated as if they were zero.</p>

`curs_pad(3CURSES)`

The `pechochar()` routine is functionally equivalent to a call to `addch(3CURSES)` followed by a call to `refresh(3CURSES)`, a call to `waddch(3CURSES)` followed by a call to `wrefresh(3CURSES)`, or a call to `waddch(3CURSES)` followed by a call to `prefresh()`. The knowledge that only a single character is being output is taken into consideration and, for non-control characters, a considerable performance gain might be seen by using these routines instead of their equivalents. In the case of `pechochar()`, the last location of the pad on the screen is reused for the arguments to `prefresh()`.

RETURN VALUES Routines that return an integer return `ERR` upon failure and an integer value other than `ERR` upon successful completion.

Routines that return pointers return `NULL` on error.

ATTRIBUTES See `attributes(5)` for descriptions of the following attributes:

ATTRIBUTE TYPE	ATTRIBUTE VALUE
MT-Level	Unsafe

SEE ALSO `addch(3CURSES)`, `curses(3CURSES)`, `refresh(3CURSES)`, `subwin(3CURSES)`, `touchline(3CURSES)`, `touchwin(3CURSES)`, `waddch(3CURSES)`, `wnoutrefresh(3CURSES)`, `wrefresh(3CURSES)`, `attributes(5)`

NOTES The header file `<curses.h>` automatically includes the header files `<stdio.h>`, `<unctrl.h>` and `<widec.h>`.

Note that `pechochar()` may be a macro.

curs_printw(3CURSES)

NAME	curs_printw, printw, wprintw, mvprintw, mvwprintw, vwprintw – print formatted output in curses windows				
SYNOPSIS	<pre>cc [flag ...] file ... -lcurses [library ...] #include <curses.h> int printw(char *fmt, /* arg */ ...); int wprintw(WINDOW *win, char *fmt, /* arg */ ...); int mvprintw(int y, int x, char *fmt, /* arg */ ...); int mvwprintw(WINDOW *win, int y, int x, char *fmt, /* arg */...); #include <varargs.h> int vwprintw(WINDOW *win, char *fmt, /* varglist */ ...);</pre>				
DESCRIPTION	<p>The <code>printw()</code>, <code>wprintw()</code>, <code>mvprintw()</code>, and <code>mvwprintw()</code> routines are analogous to <code>printf()</code> (see <code>printf(3C)</code>). In effect, the string that would be output by <code>printf()</code> is output instead as though <code>waddstr()</code> were used on the given window.</p> <p>The <code>vwprintw()</code> routine is analogous to <code>vprintf()</code> (see <code>vprintf(3C)</code>) and performs a <code>wprintw()</code> using a variable argument list. The third argument is a <code>va_list</code>, a pointer to a list of arguments, as defined in <code><varargs.h></code>.</p>				
RETURN VALUES	All routines return the integer <code>ERR</code> upon failure and an integer value other than <code>ERR</code> upon successful completion.				
ATTRIBUTES	See <code>attributes(5)</code> for descriptions of the following attributes:				
	<table border="1"><thead><tr><th>ATTRIBUTE TYPE</th><th>ATTRIBUTE VALUE</th></tr></thead><tbody><tr><td>MT-Level</td><td>Unsafe</td></tr></tbody></table>	ATTRIBUTE TYPE	ATTRIBUTE VALUE	MT-Level	Unsafe
ATTRIBUTE TYPE	ATTRIBUTE VALUE				
MT-Level	Unsafe				
SEE ALSO	<code>curses(3CURSES)</code> , <code>printf(3C)</code> , <code>vprintf(3C)</code> , <code>attributes(5)</code>				
NOTES	The header <code><curses.h></code> automatically includes the headers <code><stdio.h></code> and <code><unctrl.h></code> .				

NAME	curs_refresh, refresh, wrefresh, wnoutrefresh, doupdate, redrawwin, wredrawln – refresh curses windows and lines
SYNOPSIS	<pre>cc [flag ...] file ... -lcurses [library ...] #include <curses.h> int refresh(void); int wrefresh(WINDOW *win); int wnoutrefresh(WINDOW *win); int doupdate(void); int redrawwin(WINDOW *win); int wredrawln(WINDOW *win, int beg_line, int num_lines);</pre>
DESCRIPTION	<p>The <code>refresh()</code> and <code>wrefresh()</code> routines (or <code>wnoutrefresh()</code> and <code>doupdate()</code>) must be called to get any output on the terminal, as other routines merely manipulate data structures. The routine <code>wrefresh()</code> copies the named window to the physical terminal screen, taking into account what is already there in order to do optimizations. The <code>refresh()</code> routine is the same, using <code>stdscr</code> as the default window. Unless <code>leaveok()</code> has been enabled, the physical cursor of the terminal is left at the location of the cursor for that window.</p> <p>The <code>wnoutrefresh()</code> and <code>doupdate()</code> routines allow multiple updates with more efficiency than <code>wrefresh()</code> alone. In addition to all the window structures, <code>curses</code> keeps two data structures representing the terminal screen: a physical screen, describing what is actually on the screen, and a virtual screen, describing what the programmer wants to have on the screen.</p> <p>The routine <code>wrefresh()</code> works by first calling <code>wnoutrefresh()</code>, which copies the named window to the virtual screen, and then calling <code>doupdate()</code>, which compares the virtual screen to the physical screen and does the actual update. If the programmer wishes to output several windows at once, a series of calls to <code>wrefresh()</code> results in alternating calls to <code>wnoutrefresh()</code> and <code>doupdate()</code>, causing several bursts of output to the screen. By first calling <code>wnoutrefresh()</code> for each window, it is then possible to call <code>doupdate()</code> once, resulting in only one burst of output, with fewer total characters transmitted and less CPU time used. If the <code>win</code> argument to <code>wrefresh()</code> is the global variable <code>curscr</code>, the screen is immediately cleared and repainted from scratch.</p> <p>The <code>redrawwin()</code> routine indicates to <code>curses</code> that some screen lines are corrupted and should be thrown away before anything is written over them. These routines could be used for programs such as editors, which want a command to redraw some part of the screen or the entire screen. The routine <code>wredrawln()</code> is preferred over <code>redrawwin()</code> where a noisy communication line exists and redrawing the entire window could be subject to even more communication noise. Just redrawing several lines offers the possibility that they would show up unblemished.</p>

`curs_refresh(3CURSES)`

RETURN VALUES All routines return the integer `ERR` upon failure and an integer value other than `ERR` upon successful completion.

ATTRIBUTES See `attributes(5)` for descriptions of the following attributes:

ATTRIBUTE TYPE	ATTRIBUTE VALUE
MT-Level	Unsafe

SEE ALSO `curs_outopts(3CURSES)`, `curses(3CURSES)`, `attributes(5)`

NOTES The header `<curses.h>` automatically includes the headers `<stdio.h>` and `<unctrl.h>`.

Note that `refresh()` and `redrawwin()` may be macros.

NAME curs_scanw, scanw, wscanw, mvscanw, mvwscanw, vwscanw – convert formatted input from a curses widow

SYNOPSIS

```
cc [ flag ... ] file ... -lcurses [ library ... ]
#include <curses.h>

int scanw(char *fmt, /* arg */ ...);
int wscanw(WINDOW *win, char *fmt, /* arg */ ...);
int mvscanw(int y, int x, char *fmt, /* arg */ ...);
int mvwscanw(WINDOW *win, int y, int x, char *fmt, /* arg */...);
int vwscanw(WINDOW *win, char *fmt, va_list varlist);
```

DESCRIPTION

The scanw(), wscanw(), and mvscanw() routines correspond to scanf() (see scanf(3C)). The effect of these routines is as though wgetstr() were called on the window, and the resulting line used as input for the scan. Fields which do not map to a variable in the fmt field are lost.

The vwscanw() routine is similar to vwprintw() in that it performs a wscanw() using a variable argument list. The third argument is a va_list, a pointer to a list of arguments, as defined in <varargs.h>.

RETURN VALUES

vwscanw() returns ERR on failure and an integer equal to the number of fields scanned on success.

Applications may interrogate the return value from the scanw, wscanw(), mvscanw(), and mvwscanw() routines to determine the number of fields which were mapped in the call.

ATTRIBUTES See attributes(5) for descriptions of the following attributes:

ATTRIBUTE TYPE	ATTRIBUTE VALUE
MT-Level	Unsafe

SEE ALSO curs_getstr(3CURSES), curs_printw(3CURSES), curses(3CURSES), scanf(3C), attributes(5)

NOTES The header <curses.h> automatically includes the headers <stdio.h> and <unctrl.h>.

curs_scr_dump(3CURSES)

NAME	curs_scr_dump, scr_dump, scr_restore, scr_init, scr_set – read (write) a curses screen from (to) a file				
SYNOPSIS	<pre>cc [flag ...] file ... -lcurses [library ...] #include <curses.h> int scr_dump(char *filename); int scr_restore(char *filename); int scr_init(char *filename); int scr_set(char *filename);</pre>				
DESCRIPTION	<p>With the <code>scr_dump()</code> routine, the current contents of the virtual screen are written to the file <i>filename</i>.</p> <p>With the <code>scr_restore()</code> routine, the virtual screen is set to the contents of <i>filename</i>, which must have been written using <code>scr_dump()</code>. The next call to <code>doupdate()</code> restores the screen to the way it looked in the dump file.</p> <p>With the <code>scr_init()</code> routine, the contents of <i>filename</i> are read in and used to initialize the curses data structures about what the terminal currently has on its screen. If the data is determined to be valid, curses bases its next update of the screen on this information rather than clearing the screen and starting from scratch. <code>scr_init()</code> is used after <code>initscr()</code> or a <code>system(3C)</code> call to share the screen with another process which has done a <code>scr_dump()</code> after its <code>endwin()</code> call. The data is declared invalid if the time-stamp of the tty is old or the terminfo capabilities <code>rncup()</code> and <code>nrrmc()</code> exist.</p> <p>The <code>scr_set()</code> routine is a combination of <code>scr_restore()</code> and <code>scr_init()</code>. It tells the program that the information in <i>filename</i> is what is currently on the screen, and also what the program wants on the screen. This can be thought of as a screen inheritance function.</p> <p>To read (write) a window from (to) a file, use the <code>getwin()</code> and <code>putwin()</code> routines (see <code>curs_util(3CURSES)</code>).</p>				
RETURN VALUES	All routines return the integer <code>ERR</code> upon failure and <code>OK</code> upon success.				
ATTRIBUTES	See <code>attributes(5)</code> for descriptions of the following attributes:				
	<table border="1"><thead><tr><th>ATTRIBUTE TYPE</th><th>ATTRIBUTE VALUE</th></tr></thead><tbody><tr><td>MT-Level</td><td>Unsafe</td></tr></tbody></table>	ATTRIBUTE TYPE	ATTRIBUTE VALUE	MT-Level	Unsafe
ATTRIBUTE TYPE	ATTRIBUTE VALUE				
MT-Level	Unsafe				
SEE ALSO	<code>curs_initscr(3CURSES)</code> , <code>curs_refresh(3CURSES)</code> , <code>curs_util(3CURSES)</code> , <code>curses(3CURSES)</code> , <code>system(3C)</code> , <code>attributes(5)</code>				
NOTES	The header <code><curses.h></code> automatically includes the headers <code><stdio.h></code> and <code><unctrl.h></code> .				

`curs_scr_dump(3CURSES)`

Note that `scr_init()`, `scr_set()`, and `scr_restore()` may be macros.

curs_scroll(3CURSES)

NAME	curs_scroll, scroll, scl, wscrl – scroll a curses window				
SYNOPSIS	<pre>cc [flag ...] file ... -lcurses [library ...] #include <curses.h> int scroll(WINDOW *win); int scl(int n); int wscrl(WINDOW *win, int n);</pre>				
DESCRIPTION	<p>With the <code>scroll()</code> routine, the window is scrolled up one line. This involves moving the lines in the window data structure. As an optimization, if the scrolling region of the window is the entire screen, the physical screen is scrolled at the same time.</p> <p>With the <code>scl()</code> and <code>wscrl()</code> routines, for positive n scroll the window up n lines (line $i+n$ becomes i); otherwise scroll the window down n lines. This involves moving the lines in the window character image structure. The current cursor position is not changed.</p> <p>For these functions to work, scrolling must be enabled via <code>scrollok()</code>.</p>				
RETURN VALUES	All routines return the integer <code>ERR</code> upon failure and an integer value other than <code>ERR</code> upon successful completion.				
ATTRIBUTES	See <code>attributes(5)</code> for descriptions of the following attributes:				
	<table border="1"><thead><tr><th>ATTRIBUTE TYPE</th><th>ATTRIBUTE VALUE</th></tr></thead><tbody><tr><td>MT-Level</td><td>Unsafe</td></tr></tbody></table>	ATTRIBUTE TYPE	ATTRIBUTE VALUE	MT-Level	Unsafe
ATTRIBUTE TYPE	ATTRIBUTE VALUE				
MT-Level	Unsafe				
SEE ALSO	<code>curs_outopts(3CURSES)</code> , <code>curses(3CURSES)</code> , <code>attributes(5)</code>				
NOTES	<p>The header <code><curses.h></code> automatically includes the headers <code><stdio.h></code> and <code><unctrl.h></code>.</p> <p>Note that <code>scl()</code> and <code>scroll()</code> may be macros.</p>				

curs_slk(3CURSES)

NAME	<code>curs_slk</code> , <code>slk_init</code> , <code>slk_set</code> , <code>slk_refresh</code> , <code>slk_noutrefresh</code> , <code>slk_label</code> , <code>slk_clear</code> , <code>slk_restore</code> , <code>slk_touch</code> , <code>slk_attron</code> , <code>slk_attrset</code> , <code>slk_attroff</code> – curses soft label routines
SYNOPSIS	<pre>cc [<i>flag</i> ...] <i>file</i> ... -lcurses [<i>library</i> ...] #include <curses.h> int slk_init(int <i>fmt</i>); int slk_set(int <i>labnum</i>, char *<i>label</i>, int <i>fmt</i>); int slk_refresh(void); int slk_noutrefresh(void); char *slk_label(int <i>labnum</i>); int slk_clear(void); int slk_restore(void); int slk_touch(void); int slk_attron(chtype <i>attrs</i>); int slk_attrset(chtype <i>attrs</i>); int slk_attroff(chtype <i>attrs</i>);</pre>
DESCRIPTION	<p>curses manipulates the set of soft function-key labels that exist on many terminals. For those terminals that do not have soft labels, <code>curses</code> takes over the bottom line of <code>stdscr</code>, reducing the size of <code>stdscr</code> and the variable <code>LINES</code>. <code>curses</code> standardizes on eight labels of up to eight characters each.</p> <p>To use soft labels, the <code>slk_init()</code> routine must be called before <code>initscr()</code> or <code>newterm()</code> is called. If <code>initscr()</code> eventually uses a line from <code>stdscr</code> to emulate the soft labels, then <code>fmt</code> determines how the labels are arranged on the screen. Setting <code>fmt</code> to 0 indicates a 3-2-3 arrangement of the labels; 1 indicates a 4-4 arrangement.</p> <p>With the <code>slk_set()</code> routine, <i>labnum</i> is the label number, from 1 to 8. <i>label</i> is the string to be put on the label, up to eight characters in length. A null string or a null pointer sets up a blank label. <code>fmt</code> is either 0, 1, or 2, indicating whether the label is to be left-justified, centered, or right-justified, respectively, within the label.</p> <p>The <code>slk_refresh()</code> and <code>slk_noutrefresh()</code> routines correspond to the <code>wrefresh()</code> and <code>wnoutrefresh()</code> routines.</p> <p>With the <code>slk_label()</code> routine, the current label for label number <i>labnum</i> is returned with leading and trailing blanks stripped.</p> <p>With the <code>slk_clear()</code> routine, the soft labels are cleared from the screen.</p> <p>With the <code>slk_restore()</code> routine, the soft labels are restored to the screen after a <code>slk_clear()</code> is performed.</p>

curs_slk(3CURSES)

With the `slk_touch()` routine, all the soft labels are forced to be output the next time a `slk_noutrefresh()` is performed.

The `slk_attron()`, `slk_attrset()`, and `slk_attroff()` routines correspond to `attron()`, `attrset()`, and `attroff()`. They have an effect only if soft labels are simulated on the bottom line of the screen.

RETURN VALUES Routines that return an integer return `ERR` upon failure and an integer value other than `ERR` upon successful completion.

`slk_label()` returns `NULL` on error.

ATTRIBUTES See `attributes(5)` for descriptions of the following attributes:

ATTRIBUTE TYPE	ATTRIBUTE VALUE
MT-Level	Unsafe

SEE ALSO `curs_attr(3CURSES)`, `curs_initscr(3CURSES)`, `curs_refresh(3CURSES)`, `curses(3CURSES)`, `attributes(5)`

NOTES The header `<curses.h>` automatically includes the headers `<stdio.h>` and `<unctrl.h>`.

Most applications would use `slk_noutrefresh()` because a `wrefresh()` is likely to follow soon.

curs_termattrs(3CURSES)

NAME	<code>curs_termattrs</code> , <code>baudrate</code> , <code>erasechar</code> , <code>has_ic</code> , <code>has_il</code> , <code>killchar</code> , <code>longname</code> , <code>termattrs</code> , <code>termname</code> – curses environment query routines
SYNOPSIS	<pre>cc [<i>flag</i> ...] <i>file</i> ... -lcurses [<i>library</i> ...] #include <curses.h> int baudrate(void); char erasechar(void); int has_ic(void); int has_il(void); char killchar(void); char *longname(void); cctype termattrs(void); char *termname(void);</pre>
DESCRIPTION	<p>The <code>baudrate()</code> routine returns the output speed of the terminal. The number returned is in bits per second, for example 9600, and is an integer.</p> <p>With the <code>erasechar()</code> routine, the user's current erase character is returned.</p> <p>The <code>has_ic()</code> routine is true if the terminal has insert- and delete-character capabilities.</p> <p>The <code>has_il()</code> routine is true if the terminal has insert- and delete-line capabilities, or can simulate them using scrolling regions. This might be used to determine if it would be appropriate to turn on physical scrolling using <code>scrollok()</code>.</p> <p>With the <code>killchar()</code> routine, the user's current line kill character is returned.</p> <p>The <code>longname()</code> routine returns a pointer to a static area containing a verbose description of the current terminal. The maximum length of a verbose description is 128 characters. It is defined only after the call to <code>initscr()</code> or <code>newterm()</code>. The area is overwritten by each call to <code>newterm()</code> and is not restored by <code>set_term()</code>, so the value should be saved between calls to <code>newterm()</code> if <code>longname()</code> is going to be used with multiple terminals.</p> <p>If a given terminal doesn't support a video attribute that an application program is trying to use, <code>curses</code> may substitute a different video attribute for it. The <code>termattrs()</code> function returns a logical OR of all video attributes supported by the terminal. This information is useful when a <code>curses</code> program needs complete control over the appearance of the screen.</p> <p>The <code>termname()</code> routine returns the value of the environment variable <code>TERM</code> (truncated to 14 characters).</p>
RETURN VALUES	<code>longname()</code> and <code>termname()</code> return <code>NULL</code> on error.

`curs_termattrs(3CURSES)`

Routines that return an integer return ERR upon failure and an integer value other than ERR upon successful completion.

ATTRIBUTES See `attributes(5)` for descriptions of the following attributes:

ATTRIBUTE TYPE	ATTRIBUTE VALUE
MT-Level	Unsafe

SEE ALSO `curs_initscr(3CURSES)`, `curs_outopts(3CURSES)`, `curses(3CURSES)`, `attributes(5)`

NOTES The header `<curses.h>` automatically includes the headers `<stdio.h>` and `<unctrl.h>`.

Note that `termattrs()` may be a macro.

curs_termcap(3CURSES)

NAME	curs_termcap, tgetent, tgetflag, tgetnum, tgetstr, tgoto – curses interfaces (emulated) to the termcap library				
SYNOPSIS	<pre>cc [flag ...] file ... -lcurses [library ...] #include <curses.h> #include <term.h> int tgetent(char *bp, char *name); int tgetflag(char id[2]); int tgetnum(char id[2]); char *tgetstr(char id[2], char **area); char *tgoto(char *cap, int col, int row); int tputs(char *str, int affcnt, int (*putc)(void));</pre>				
DESCRIPTION	<p>These routines are included as a conversion aid for programs that use the <i>termcap</i> library. Their parameters are the same and the routines are emulated using the <i>terminfo</i> database. These routines are supported at Level 2 and should not be used in new applications.</p> <p>The <code>tgetent()</code> routine looks up the termcap entry for <i>name</i>. The emulation ignores the buffer pointer <i>bp</i>.</p> <p>The <code>tgetflag()</code> routine gets the boolean entry for <i>id</i>.</p> <p>The <code>tgetnum()</code> routine gets the numeric entry for <i>id</i>.</p> <p>The <code>tgetstr()</code> routine returns the string entry for <i>id</i>. Use <code>tputs()</code> to output the returned string.</p> <p>The <code>tgoto()</code> routine instantiates the parameters into the given capability. The output from this routine is to be passed to <code>tputs()</code>.</p> <p>The <code>tputs()</code> routine is described on the <code>curs_terminfo(3CURSES)</code> manual page.</p>				
RETURN VALUES	<p>Routines that return an integer return <code>ERR</code> upon failure and an integer value other than <code>ERR</code> upon successful completion.</p> <p>Routines that return pointers return <code>NULL</code> on error.</p>				
ATTRIBUTES	<p>See <code>attributes(5)</code> for descriptions of the following attributes:</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th style="text-align: center;">ATTRIBUTE TYPE</th> <th style="text-align: center;">ATTRIBUTE VALUE</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">MT-Level</td> <td style="text-align: center;">Unsafe</td> </tr> </tbody> </table>	ATTRIBUTE TYPE	ATTRIBUTE VALUE	MT-Level	Unsafe
ATTRIBUTE TYPE	ATTRIBUTE VALUE				
MT-Level	Unsafe				
SEE ALSO	<code>curs_terminfo(3CURSES)</code> , <code>curses(3CURSES)</code> , <code>putc(3C)</code> , <code>attributes(5)</code>				

`curs_termincap(3CURSES)`

NOTES | The header `<curses.h>` automatically includes the headers `<stdio.h>` and `<unctrl.h>`.

curs_terminfo(3CURSES)

NAME	curs_terminfo, setupterm, setterm, set_curterm, del_curterm, restartterm, tparm, tputs, putp, vidputs, vidattr, mvcur, tigetflag, tigetnum, tigetstr – curses interfaces to terminfo database
SYNOPSIS	<pre>cc [flag ...] file ... -lcurses [library ...] #include <curses.h> #include <term.h> int setupterm(char *term, int fildes, int *errret); int setterm(char *term); int set_curterm(TERMINAL *nterm); int del_curterm(TERMINAL *oterm); int restartterm(char *term, int fildes, int *errret); char *tparm(char *str, long int p1, long int p2, long int p3, long int p4, long int p5, long int p6, long int p7, long int p8, long int p9); int tputs(char *str, int affcnt, int (*putc)(char)); int putp(char *str); int vidputs(chtype attrs, int (*putc)(char)); int vidattr(chtype attrs); int mvcur(int oldrow, int oldcol, int newrow, int newcol); int tigetflag(char *capname); int tigetnum(char *capname); char *tigetstr(char *capname);</pre>
DESCRIPTION	<p>These low-level routines must be called by programs that have to deal directly with the <i>terminfo</i> database to handle certain terminal capabilities, such as programming function keys. For all other functionality, curses routines are more suitable and their use is recommended.</p> <p>Initially, <code>setupterm()</code> should be called. Note that <code>setupterm()</code> is automatically called by <code>initscr()</code> and <code>newterm()</code>. This defines the set of terminal-dependent variables (listed in <code>terminfo(4)</code>). The <i>terminfo</i> variables <code>lines</code> and <code>columns</code> are initialized by <code>setupterm()</code> as follows: If <code>use_env(FALSE)</code> has been called, values for <code>lines</code> and <code>columns</code> specified in <i>terminfo</i> are used. Otherwise, if the environment variables <code>LINES</code> and <code>COLUMNS</code> exist, their values are used. If these environment variables do not exist and the program is running in a window, the current window size is used. Otherwise, if the environment variables do not exist, the values for <code>lines</code> and <code>columns</code> specified in the <i>terminfo</i> database are used.</p> <p>The headers <code><curses.h></code> and <code><term.h></code> should be included (in this order) to get the definitions for these strings, numbers, and flags. Parameterized strings should be passed through <code>tparm()</code> to instantiate them. All <i>terminfo</i> strings (including the output</p>

of `tparm()` should be printed with `tputs()` or `putp()`. Call the `reset_shell_mode()` routine to restore the tty modes before exiting (see `curs_kernel(3CURSES)`). Programs which use cursor addressing should output `enter_ca_mode` upon startup and should output `exit_ca_mode` before exiting. Programs desiring shell escapes should call `reset_shell_mode` and output `exit_ca_mode` before the shell is called and should output `enter_ca_mode` and call `reset_prog_mode` after returning from the shell.

The `setupterm()` routine reads in the *terminfo* database, initializing the *terminfo* structures, but does not set up the output virtualization structures used by *curses*. The terminal type is the character string *term*; if *term* is null, the environment variable `TERM` is used. All output is to file descriptor *fildev* which is initialized for output. If *errret* is not null, then `setupterm()` returns `OK` or `ERR` and stores a status value in the integer pointed to by *errret*. A status of 1 in *errret* is normal, 0 means that the terminal could not be found, and -1 means that the *terminfo* database could not be found. If *errret* is null, `setupterm()` prints an error message upon finding an error and exits. Thus, the simplest call is:

```
setupterm((char *)0, 1, (int *)0);
```

which uses all the defaults and sends the output to `stdout`.

The `setterm()` routine is being replaced by `setupterm()`. The call:

```
setupterm(term, 1, (int *)0)
```

provides the same functionality as `setterm(term)`. The `setterm()` routine is included here for compatibility and is supported at Level 2.

The `set_curterm()` routine sets the variable `cur_term` to *nterm*, and makes all of the *terminfo* boolean, numeric, and string variables use the values from *nterm*.

The `del_curterm()` routine frees the space pointed to by *oterm* and makes it available for further use. If *oterm* is the same as `cur_term`, references to any of the *terminfo* boolean, numeric, and string variables thereafter may refer to invalid memory locations until another `setupterm()` has been called.

The `restartterm()` routine is similar to `setupterm()` and `initscr()`, except that it is called after restoring memory to a previous state. It assumes that the windows and the input and output options are the same as when memory was saved, but the terminal type and baud rate may be different.

The `tparm()` routine instantiates the string *str* with parameters *pi*. A pointer is returned to the result of *str* with the parameters applied.

The `tputs()` routine applies padding information to the string *str* and outputs it. The *str* must be a *terminfo* string variable or the return value from `tparm()`, `tgetstr()`, or `tgoto()`. *affcnt* is the number of lines affected, or 1 if not applicable. *putc* is a `putchar()`-like routine to which the characters are passed, one at a time.

curs_terminfo(3CURSES)

The `putp()` routine calls `tputs(str, 1, putchar)`. Note that the output of `putpA()` always goes to `stdout`, not to the *files* specified in `setupterm()`.

The `vidputs()` routine displays the string on the terminal in the video attribute mode *attrs*, which is any combination of the attributes listed in `curses(3CURSES)`. The characters are passed to the `putchar()`-like routine `putc()`.

The `vidattr()` routine is like the `vidputs()` routine, except that it outputs through `putchar()`.

The `mvcur()` routine provides low-level cursor motion.

The `tigetflag()`, `tigetnum()` and `tigetstr()` routines return the value of the capability corresponding to the *terminfo capname* passed to them, such as `xenl`.

With the `tigetflag()` routine, the value `-1` is returned if *capname* is not a boolean capability.

With the `tigetnum()` routine, the value `-2` is returned if *capname* is not a numeric capability.

With the `tigetstr()` routine, the value `(char *)-1` is returned if *capname* is not a string capability.

The *capname* for each capability is given in the table column entitled *capname code* in the capabilities section of `terminfo(4)`.

```
char *boolnames, *boolcodes, *boolfnames
char *numnames, *numcodes, *numfnames
char *strnames, *strcodes, *strfnames
```

These null-terminated arrays contain the *capnames*, the *termcap* codes, and the full C names, for each of the *terminfo* variables.

RETURN VALUES

All routines return the integer `ERR` upon failure and an integer value other than `ERR` upon successful completion, unless otherwise noted in the preceding routine descriptions.

Routines that return pointers always return `NULL` on error.

ATTRIBUTES

See `attributes(5)` for descriptions of the following attributes:

ATTRIBUTE TYPE	ATTRIBUTE VALUE
MT-Level	Unsafe

SEE ALSO

`curs_initscr(3CURSES)`, `curs_kernel(3CURSES)`, `curs_termcap(3CURSES)`, `curses(3CURSES)`, `putc(3C)`, `terminfo(4)`, `attributes(5)`

NOTES | The header `<curses.h>` automatically includes the headers `<stdio.h>` and `<unctrl.h>`.

The `setupterm()` routine should be used in place of `setterm()`.

Note that `vidattr()` and `vidputs()` may be macros.

curs_touch(3CURSES)

NAME	curs_touch, touchwin, touchline, untouchwin, wtouchln, is_linetouched, is_wintouched – curses refresh control routines				
SYNOPSIS	<pre>cc [flag ...] file ... -lcurses [library ...] #include <curses.h> int touchwin(WINDOW *win); int touchline(WINDOW *win, int start, int count); int untouchwin(WINDOW *win); int wtouchln(WINDOW *win, int y, int n, int changed); int is_linetouched(WINDOW *win, int line); int is_wintouched(WINDOW *win);</pre>				
DESCRIPTION	<p>The touchwin() and touchline() routines throw away all optimization information about which parts of the window have been touched, by pretending that the entire window has been drawn on. This is sometimes necessary when using overlapping windows, since a change to one window affects the other window, but the records of which lines have been changed in the other window do not reflect the change. The routine touchline() only pretends that <i>count</i> lines have been changed, beginning with line <i>start</i>.</p> <p>The untouchwin() routine marks all lines in the window as unchanged since the last call to wrefresh().</p> <p>The wtouchln() routine makes <i>n</i> lines in the window, starting at line <i>y</i>, look as if they have (<i>changed</i>=1) or have not (<i>changed</i>=0) been changed since the last call to wrefresh().</p> <p>The is_linetouched() and is_wintouched() routines return TRUE if the specified line/window was modified since the last call to wrefresh(); otherwise they return FALSE. In addition, is_linetouched() returns ERR if line is not valid for the given window.</p>				
RETURN VALUES	All routines return the integer ERR upon failure and an integer value other than ERR upon successful completion, unless otherwise noted in the preceding routine descriptions.				
ATTRIBUTES	See attributes(5) for descriptions of the following attributes:				
	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">ATTRIBUTE TYPE</th> <th style="text-align: center;">ATTRIBUTE VALUE</th> </tr> </thead> <tbody> <tr> <td>MT-Level</td> <td>Unsafe</td> </tr> </tbody> </table>	ATTRIBUTE TYPE	ATTRIBUTE VALUE	MT-Level	Unsafe
ATTRIBUTE TYPE	ATTRIBUTE VALUE				
MT-Level	Unsafe				
SEE ALSO	curs_refresh(3CURSES), curses(3CURSES), attributes(5)				
NOTES	The header <curses.h> automatically includes the headers <stdio.h> and <unctrl.h>.				

`curs_touch(3CURSES)`

Note that all routines except `wtouchln()` may be macros.

curs_util(3CURSES)

NAME	curs_util, unctrl, keyname, filter, use_env, putwin, getwin, delay_output, flushingp – curses miscellaneous utility routines
SYNOPSIS	<pre>cc [<i>flag</i> ...] <i>file</i> ... -lcurses [<i>library</i> ...] #include <curses.h> char *unctrl (chtype <i>c</i>); char *keyname (int <i>c</i>); int filter (void); void use_env (char <i>bool</i>); int putwin (WINDOW *<i>win</i>, FILE *<i>filep</i>); WINDOW *getwin (FILE *<i>filep</i>); int delay_output (int <i>ms</i>); int flushingp (void);</pre>
DESCRIPTION	<p>The unctrl () macro expands to a character string which is a printable representation of the character <i>c</i>. Control characters are displayed in the ^X notation. Printing characters are displayed as is.</p> <p>With the keyname () routine, a character string corresponding to the key <i>c</i> is returned.</p> <p>The filter () routine, if used, is called before initscr () or newterm () are called. It makes curses think that there is a one-line screen. curses does not use any terminal capabilities that assume that they know on what line of the screen the cursor is positioned.</p> <p>The use_env () routine, if used, is called before initscr () or newterm () are called. When called with FALSE as an argument, the values of lines and columns specified in the terminfo database will be used, even if environment variables LINES and COLUMNS (used by default) are set, or if curses is running in a window (in which case default behavior would be to use the window size if LINES and COLUMNS are not set).</p> <p>With the putwin () routine, all data associated with window <i>win</i> is written into the file to which <i>filep</i> points. This information can be later retrieved using the getwin () function.</p> <p>The getwin () routine reads window related data stored in the file by putwin (). The routine then creates and initializes a new window using that data. It returns a pointer to the new window.</p> <p>The delay_output () routine inserts an <i>ms</i> millisecond pause in output. This routine should not be used extensively because padding characters are used rather than a CPU pause.</p> <p>The flushingp () routine throws away any typeahead that has been typed by the user and has not yet been read by the program.</p>

RETURN VALUES Except for flushinp(), routines that return an integer return ERR upon failure and an integer value other than ERR upon successful completion.

flushinp() always returns OK.

Routines that return pointers return NULL on error.

ATTRIBUTES See attributes(5) for descriptions of the following attributes:

ATTRIBUTE TYPE	ATTRIBUTE VALUE
MT-Level	Unsafe

SEE ALSO curs_initscr(3CURSES), curs_scr_dump(3CURSES), curses(3CURSES), attributes(5)

NOTES The header < curses.h > automatically includes the headers < stdio.h > and < unctrl.h >.

Note that unctrl() is a macro, which is defined in < unctrl.h >.

curs_window(3CURSES)

NAME	<code>curs_window</code> , <code>newwin</code> , <code>delwin</code> , <code>mvwin</code> , <code>subwin</code> , <code>derwin</code> , <code>mvderwin</code> , <code>dupwin</code> , <code>wsyncup</code> , <code>syncok</code> , <code>wcursyncup</code> , <code>wsyncdown</code> – create curses windows
SYNOPSIS	<pre>cc [flag ...] file ... -lcurses [library ...] #include <curses.h> WINDOW *newwin(int nlines, int ncols, int begin_y, int begin_x); int delwin(WINDOW *win); int mvwin(WINDOW *win, int y, int x); WINDOW *subwin(WINDOW *orig, int nlines, int ncols, int begin_y, int begin_x); WINDOW *derwin(WINDOW *orig, int nlines, int ncols, int begin_y, int begin_x); int mvderwin(WINDOW *win, int par_y, int par_x); WINDOW *dupwin(WINDOW *win); void wsyncup(WINDOW *win); int syncok(WINDOW *win, bool bf); void wcursyncup(WINDOW *win); void wsyncdown(WINDOW *win);</pre>
DESCRIPTION	<p>The <code>newwin()</code> routine creates and returns a pointer to a new window with the given number of lines, <i>nlines</i>, and columns, <i>ncols</i>. The upper left-hand corner of the window is at line <i>begin_y</i>, column <i>begin_x</i>. If either <i>nlines</i> or <i>ncols</i> is zero, they default to <code>LINES</code> — <i>begin_y</i> and <code>COLS</code> — <i>begin_x</i>. A new full-screen window is created by calling <code>newwin(0, 0, 0, 0)</code>.</p> <p>The <code>delwin()</code> routine deletes the named window, freeing all memory associated with it. Subwindows must be deleted before the main window can be deleted.</p> <p>The <code>mvwin()</code> routine moves the window so that the upper left-hand corner is at position (<i>x</i>, <i>y</i>). If the move would cause the window to be off the screen, it is an error and the window is not moved. Moving subwindows is allowed, but should be avoided.</p> <p>The <code>subwin()</code> routine creates and returns a pointer to a new window with the given number of lines, <i>nlines</i>, and columns, <i>ncols</i>. The window is at position (<i>begin_y</i>, <i>begin_x</i>) on the screen. (This position is relative to the screen, and not to the window <i>orig</i>.) The window is made in the middle of the window <i>orig</i>, so that changes made to one window will affect both windows. The subwindow shares memory with the window <i>orig</i>. When using this routine, it is necessary to call <code>touchwin()</code> or <code>touchline()</code> on <i>orig</i> before calling <code>wrefresh()</code> on the subwindow.</p> <p>The <code>derwin()</code> routine is the same as <code>subwin()</code>, except that <i>begin_y</i> and <i>begin_x</i> are relative to the origin of the window <i>orig</i> rather than the screen. There is no difference between the subwindows and the derived windows.</p>

curs_window(3CURSES)

The `mvderwin()` routine moves a derived window (or subwindow) inside its parent window. The screen-relative parameters of the window are not changed. This routine is used to display different parts of the parent window at the same physical position on the screen.

The `dupwin()` routine creates an exact duplicate of the window *win*.

Each `curses` window maintains two data structures: the character image structure and the status structure. The character image structure is shared among all windows in the window hierarchy (that is, the window with all subwindows). The status structure, which contains information about individual line changes in the window, is private to each window. The routine `wrefresh()` uses the status data structure when performing screen updating. Since status structures are not shared, changes made to one window in the hierarchy may not be properly reflected on the screen.

The routine `wsyncup()` causes the changes in the status structure of a window to be reflected in the status structures of its ancestors. If `syncok()` is called with second argument `TRUE` then `wsyncup()` is called automatically whenever there is a change in the window.

The routine `wcursyncup()` updates the current cursor position of all the ancestors of the window to reflect the current cursor position of the window.

The routine `wsyncdown()` updates the status structure of the window to reflect the changes in the status structures of its ancestors. Applications seldom call this routine because it is called automatically by `wrefresh()`.

RETURN VALUES

Routines that return an integer return the integer `ERR` upon failure and an integer value other than `ERR` upon successful completion.

`delwin()` returns the integer `ERR` upon failure and `OK` upon successful completion.

Routines that return pointers return `NULL` on error.

ATTRIBUTES

See `attributes(5)` for descriptions of the following attributes:

ATTRIBUTE TYPE	ATTRIBUTE VALUE
MT-Level	Unsafe

SEE ALSO

`curs_refresh(3CURSES)`, `curs_touch(3CURSES)`, `curses(3CURSES)`, `attributes(5)`

NOTES

The header `<curses.h>` automatically includes the headers `<stdio.h>` and `<unctrl.h>`.

If many small changes are made to the window, the `wsyncup()` option could degrade performance.

`curs_window(3CURSES)`

Note that `syncok()` may be a macro.

- NAME** cur_term – current terminal information
- SYNOPSIS**
- ```
cc [flag...] file... -I /usr/xpg4/include -L /usr/xpg4/lib \
-R /usr/xpg4/lib -lcurses [library...]

c89 [flag...] file... -lcurses [library...]

#include <curses.h>

extern TERMINAL *cur_term;
```
- DESCRIPTION** The external variable `cur_term` to identifies the record in the terminfo associated with the terminal currently in use.
- ATTRIBUTES** See `attributes(5)` for descriptions of the following attributes:

| ATTRIBUTE TYPE      | ATTRIBUTE VALUE |
|---------------------|-----------------|
| Interface Stability | Standard        |
| MT-Level            | Unsafe          |

- SEE ALSO** `libcurses(3XCURSES)`, `set_curterm(3XCURSES)`, `tigetflag(3XCURSES)`, `attributes(5)`, `standards(5)`

## def\_prog\_mode(3XCURSES)

| <b>NAME</b>          | def_prog_mode, def_shell_mode, reset_prog_mode, reset_shell_mode – save/restore terminal modes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                |                 |                     |          |          |        |
|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-----------------|---------------------|----------|----------|--------|
| <b>SYNOPSIS</b>      | <pre>cc [ flag... ] file... -I /usr/xpg4/include -L /usr/xpg4/lib \ -R /usr/xpg4/lib -lcurses [ library... ]  c89 [ flag... ] file... -lcurses [ library... ]  #include &lt;curses.h&gt;  int def_prog_mode(void); int def_shell_mode(void); int reset_prog_mode(void); int reset_shell_mode(void);</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                |                 |                     |          |          |        |
| <b>DESCRIPTION</b>   | <p>The <code>def_prog_mode()</code> and <code>def_shell_mode()</code> functions save the current terminal modes as "program" (within X/Open Curses) or "shell" (outside X/Open Curses). The modes are saved automatically by <code>initscr(3XCURSES)</code>, <code>newterm(3XCURSES)</code>, and <code>setupterm(3XCURSES)</code>.</p> <p>The <code>reset_prog_mode()</code> and <code>reset_shell_mode()</code> functions reset the current terminal modes to "program" (within X/Open Curses) or "shell" (outside X/Open Curses). The <code>endwin(3XCURSES)</code> function automatically calls the <code>reset_shell_mode()</code> function and the <code>doupdate(3XCURSES)</code> function calls the <code>reset_prog_mode()</code> function after calling <code>endwin()</code>.</p> |                |                 |                     |          |          |        |
| <b>RETURN VALUES</b> | On success, these functions return OK. Otherwise, they return ERR.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                |                 |                     |          |          |        |
| <b>ERRORS</b>        | None.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |                 |                     |          |          |        |
| <b>ATTRIBUTES</b>    | See <code>attributes(5)</code> for descriptions of the following attributes:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                |                 |                     |          |          |        |
|                      | <table border="1"><thead><tr><th>ATTRIBUTE TYPE</th><th>ATTRIBUTE VALUE</th></tr></thead><tbody><tr><td>Interface Stability</td><td>Standard</td></tr><tr><td>MT-Level</td><td>Unsafe</td></tr></tbody></table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | ATTRIBUTE TYPE | ATTRIBUTE VALUE | Interface Stability | Standard | MT-Level | Unsafe |
| ATTRIBUTE TYPE       | ATTRIBUTE VALUE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                |                 |                     |          |          |        |
| Interface Stability  | Standard                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                |                 |                     |          |          |        |
| MT-Level             | Unsafe                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                |                 |                     |          |          |        |
| <b>SEE ALSO</b>      | <code>endwin(3XCURSES)</code> , <code>initscr(3XCURSES)</code> , <code>libcurses(3XCURSES)</code> , <code>newterm(3XCURSES)</code> , <code>setupterm(3XCURSES)</code> , <code>attributes(5)</code> , <code>standards(5)</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                |                 |                     |          |          |        |

- NAME** delay\_output – delays output
- SYNOPSIS**

```
cc [flag...] file... -I /usr/xpg4/include -L /usr/xpg4/lib \
-R /usr/xpg4/lib -lcurses [library...]

c89 [flag...] file... -lcurses [library...]

#include <curses.h>

int delay_output(int ms);
```
- DESCRIPTION** The delay\_output() function delays output for *ms* milliseconds by inserting pad characters in the output stream.
- PARAMETERS** *ms* Is the number of milliseconds to delay the output.
- RETURN VALUES** On success, the delay\_output() function returns OK. Otherwise, it returns ERR.
- ERRORS** None.
- ATTRIBUTES** See attributes(5) for descriptions of the following attributes:

| ATTRIBUTE TYPE      | ATTRIBUTE VALUE |
|---------------------|-----------------|
| Interface Stability | Standard        |
| MT-Level            | Unsafe          |

**SEE ALSO** libcurses(3XCURSES), napms(3XCURSES), attributes(5), standards(5)

## delch(3XCURSES)

**NAME** delch, mvdelch, mvwdelch, wdelch – remove a character

**SYNOPSIS**

```
cc [flag...] file... -I /usr/xpg4/include -L /usr/xpg4/lib \
-R /usr/xpg4/lib -lcurses [library...]

c89 [flag...] file... -lcurses [library...]

#include <curses.h>

int delch(void);

int mvdelch(int y, int x);

int mvwdelch(WINDOW *win, int y, int x);

int wdelch(WINDOW *win);
```

**DESCRIPTION**

The `delch()` and `wdelch()` functions delete the character at the current cursor position from `stdscr` and `win`, respectively. All remaining characters after cursor through to the end of the line are shifted one character towards the start of the line. The last character on the line becomes a space; characters on other lines are not affected.

The `mvdelch()` and `mvwdelch()` functions delete the character at the position specified by the `x` and `y` parameters; the former deletes the character from `stdscr`; the latter from `win`.

**PARAMETERS**

`y` Is the `y` (row) coordinate of the position of the character to be removed.

`x` Is the `x` (column) coordinate of the position of the character to be removed.

`win` Is a pointer to the window containing the character to be removed.

**RETURN VALUES** On success, these functions return `OK`. Otherwise, they return `ERR`.

**ERRORS** None.

**ATTRIBUTES** See `attributes(5)` for descriptions of the following attributes:

| ATTRIBUTE TYPE      | ATTRIBUTE VALUE |
|---------------------|-----------------|
| Interface Stability | Standard        |
| MT-Level            | Unsafe          |

**SEE ALSO** `bkgdset(3XCURSES)`, `insch(3XCURSES)`, `libcurses(3XCURSES)`, `attributes(5)`, `standards(5)`

| <b>NAME</b>        | del_curterm, restartterm, set_curterm, setupterm – interfaces to the terminfo database                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |       |             |   |        |   |                             |    |                                                   |
|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------------|---|--------|---|-----------------------------|----|---------------------------------------------------|
| <b>SYNOPSIS</b>    | <pre>cc [ flag... ] file... -I /usr/xpg4/include -L /usr/xpg4/lib \ -R /usr/xpg4/lib -lcurses [ library... ]  c89 [ flag... ] file... -lcurses [ library... ]  #include &lt;term.h&gt;  int del_curterm(TERMINAL *oterm);  int restartterm(char *term, int fildes, int *errret);  TERMINAL *set_curterm(TERMINAL *nterm);  int setupterm(char *term, int fildes, int *errret);</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |       |             |   |        |   |                             |    |                                                   |
| <b>DESCRIPTION</b> | <p>Within X/Open Curses, the <code>setupterm()</code> function is automatically called by the <code>initscr(3XC)</code> and <code>newterm(3XC)</code> functions. This function can be also be used outside of X/Open Curses when a program has to deal directly with the <code>terminfo</code> database to handle certain terminal capabilities. The use of appropriate X/Open Curses functions is recommended in all other situations.</p> <p>The <code>setupterm()</code> function loads terminal-dependent variables for the <code>terminfo</code> layer of X/Open Curses. The <code>setupterm()</code> function initializes the <code>terminfo</code> variables <code>lines</code> and <code>columns</code> such that if <code>use_env(FALSE)</code> has been called, the <code>terminfo</code> values assigned in the database are used regardless of the environmental variables <code>LINES</code> and <code>COLUMNS</code> or the program's window dimensions; when <code>use_env(TRUE)</code> has been called, which is the default, the environment variables <code>LINES</code> and <code>COLUMNS</code> are used, if they exist. If the environment variables do not exist and the program is running in a window, the current window size is used.</p> <p>The <code>term</code> parameter of <code>setupterm()</code> specifies the terminal; if null, terminal type is taken from the <code>TERM</code> environment variable. All output is sent to <code>fildes</code> which is initialized for output. If <code>errret</code> is not null, <code>OK</code> or <code>ERR</code> is returned and a status value is stored in the integer pointed to by <code>errret</code>. The following status values may be returned:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Value</th> <th style="text-align: center;">Description</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1</td> <td>Normal</td> </tr> <tr> <td style="text-align: center;">0</td> <td>Terminal could not be found</td> </tr> <tr> <td style="text-align: center;">-1</td> <td><code>terminfo</code> database could not be found</td> </tr> </tbody> </table> <p>If <code>errret</code> is null, an error message is printed, and the <code>setupterm()</code> function calls the <code>exit()</code> function with a non-zero parameter.</p> | Value | Description | 1 | Normal | 0 | Terminal could not be found | -1 | <code>terminfo</code> database could not be found |
| Value              | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |       |             |   |        |   |                             |    |                                                   |
| 1                  | Normal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |       |             |   |        |   |                             |    |                                                   |
| 0                  | Terminal could not be found                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |       |             |   |        |   |                             |    |                                                   |
| -1                 | <code>terminfo</code> database could not be found                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |       |             |   |        |   |                             |    |                                                   |

## del\_curterm(3XCURSES)

The `set_curterm()` function sets the `cur_term` variable to `nterm`. The values from `nterm` as well as other state information for the terminal are used by X/Open Curses functions such as `beep(3XCURSES)`, `flash(3XCURSES)`, `mvcur(3XCURSES)`, `tigetflag(3XCURSES)`, `tigetstr(3XCURSES)`, and `tigetnum(3XCURSES)`.

The `del_curterm()` function frees the space pointed to by `oterm`. If `oterm` and the `cur_term` variable are the same, all Boolean, numeric, or string terminfo variables will refer to invalid memory locations until you call `setupterm()` and specify a new terminal type.

The `restartterm()` function assumes that a call to `setupterm()` has already been made (probably from `initscr()` or `newterm()`). It allows you to specify a new terminal type in `term` and updates the data returned by `baudrate(3XCURSES)` based on `fildev`. Other information created by the `initscr()`, `newterm()`, and `setupterm()` functions is preserved.

|                   |               |                                                                 |
|-------------------|---------------|-----------------------------------------------------------------|
| <b>PARAMETERS</b> | <i>oterm</i>  | Is the terminal type for which to free space.                   |
|                   | <i>term</i>   | Is the terminal type for which variables are set.               |
|                   | <i>fildev</i> | Is a file descriptor initialized for output.                    |
|                   | <i>errret</i> | Is a pointer to an integer in which the status value is stored. |
|                   | <i>nterm</i>  | Is the new terminal to become the current terminal.             |

**RETURN VALUES** On success, the `set_curterm()` function returns the previous value of `cur_term`. Otherwise, it returns a null pointer.

On success, the other functions return `OK`. Otherwise, they return `ERR`.

**ERRORS** None.

**ATTRIBUTES** See `attributes(5)` for descriptions of the following attributes:

| ATTRIBUTE TYPE      | ATTRIBUTE VALUE |
|---------------------|-----------------|
| Interface Stability | Standard        |
| MT-Level            | Unsafe          |

**SEE ALSO** `baudrate(3XCURSES)`, `beep(3XCURSES)`, `initscr(3XCURSES)`, `libcurses(3XCURSES)`, `mvcur(3XCURSES)`, `tigetflag(3XCURSES)`, `use_env(3XCURSES)`, `attributes(5)`, `standards(5)`

**NAME** deleteln, wdeleteln – remove a line

**SYNOPSIS**

```
cc [flag...] file... -I /usr/xpg4/include -L /usr/xpg4/lib \
-R /usr/xpg4/lib -lcurses [library...]

c89 [flag...] file... -lcurses [library...]

#include <curses.h>

int deleteln(void);

int wdeleteln(WINDOW *win);
```

**DESCRIPTION** The `deleteln()` and `wdeleteln()` functions delete the line containing the cursor from `stdscr` and `win`, respectively. All lines below the one deleted are moved up one line. The last line of the window becomes blank. The position of the cursor is unchanged.

**PARAMETERS** `win` Is a pointer to the window from which the line is removed.

**RETURN VALUES** On success, these functions return OK. Otherwise, they return ERR.

**ERRORS** None.

**ATTRIBUTES** See `attributes(5)` for descriptions of the following attributes:

| ATTRIBUTE TYPE      | ATTRIBUTE VALUE |
|---------------------|-----------------|
| Interface Stability | Standard        |
| MT-Level            | Unsafe          |

**SEE ALSO** `bkgdset(3XCURSES)`, `insdelln(3XCURSES)`, `insertln(3XCURSES)`, `libcurses(3XCURSES)`, `attributes(5)`, `standards(5)`

## delscreen(3XCURSES)

**NAME** | `delscreen` – free space associated with the SCREEN data structure

**SYNOPSIS** | 

```
cc [flag...] file... -I /usr/xpg4/include -L /usr/xpg4/lib \
-R /usr/xpg4/lib -lcurses [library...]

c89 [flag...] file... -lcurses [library...]

#include <curses.h>

void delscreen(SCREEN *sp);
```

**DESCRIPTION** | The `delscreen()` function frees space associated with the SCREEN data structure. This function should be called after `endwin(3XCURSES)` if a SCREEN data structure is no longer needed.

**PARAMETERS** | `sp` Is a pointer to the screen structure for which to free space.

**RETURN VALUES** | The `delscreen()` function does not return a value.

**ERRORS** | None.

**ATTRIBUTES** | See `attributes(5)` for descriptions of the following attributes:

| ATTRIBUTE TYPE      | ATTRIBUTE VALUE |
|---------------------|-----------------|
| Interface Stability | Standard        |
| MT-Level            | Unsafe          |

**SEE ALSO** | `endwin(3XCURSES)`, `initscr(3XCURSES)`, `libcurses(3XCURSES)`, `newterm(3XCURSES)`, `attributes(5)`, `standards(5)`

**NAME** delwin – delete a window

**SYNOPSIS**

```
cc [flag...] file... -I /usr/xpg4/include -L /usr/xpg4/lib \
-R /usr/xpg4/lib -lcurses [library...]

c89 [flag...] file... -lcurses [library...]

#include <curses.h>

int delwin(WINDOW *win);
```

**DESCRIPTION** The delwin() function deletes the specified window, freeing up the memory associated with it.

Deleting a parent window without deleting its subwindows and then trying to manipulate the subwindows will have undefined results.

**PARAMETERS** *win* Is a pointer to the window that is to be deleted.

**RETURN VALUES** On success, this functions returns OK. Otherwise, it returns ERR.

**ERRORS** None.

**ATTRIBUTES** See attributes(5) for descriptions of the following attributes:

| ATTRIBUTE TYPE      | ATTRIBUTE VALUE |
|---------------------|-----------------|
| Interface Stability | Standard        |
| MT-Level            | Unsafe          |

**SEE ALSO** derwin(3XCURSES), dupwin(3XCURSES), libcurses(3XCURSES), attributes(5), standards(5)

## derwin(3XCURSES)

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |             |                                                                    |               |                                          |              |                                            |                |                                                                                                     |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|--------------------------------------------------------------------|---------------|------------------------------------------|--------------|--------------------------------------------|----------------|-----------------------------------------------------------------------------------------------------|
| <b>NAME</b>        | derwin, newwin, subwin – create a new window or subwindow                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |             |                                                                    |               |                                          |              |                                            |                |                                                                                                     |
| <b>SYNOPSIS</b>    | <pre>cc [ flag... ] file... -I /usr/xpg4/include -L /usr/xpg4/lib \ -R /usr/xpg4/lib -lcurses [ library... ]  c89 [ flag... ] file... -lcurses [ library... ]  #include &lt;curses.h&gt;  WINDOW *derwin(WINDOW *orig, int nlines, int ncols, int begin_y, int begin_x);  WINDOW *newwin(int nlines, int ncols, int begin_y, int begin_x);  WINDOW *subwin(WINDOW *orig, int nlines, int ncols, int begin_y, int begin_x);</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |             |                                                                    |               |                                          |              |                                            |                |                                                                                                     |
| <b>DESCRIPTION</b> | <p>The <code>derwin()</code> function creates a subwindow within window <i>orig</i>, with the specified number of lines and columns, and upper left corner positioned at <i>begin_x</i>, <i>begin_y</i> relative to window <i>orig</i>. A pointer to the new window structure is returned.</p> <p>The <code>newwin()</code> function creates a new window with the specified number of lines and columns and upper left corner positioned at <i>begin_x</i>, <i>begin_y</i>. A pointer to the new window structure is returned. A full-screen window can be created by calling <code>newwin(0, 0, 0, 0)</code>.</p> <p>If the number of lines specified is zero, <code>newwin()</code> uses a default value of <code>LINES</code> minus <i>begin_y</i>; if the number of columns specified is zero, <code>newwin()</code> uses the default value of <code>COLS</code> minus <i>begin_x</i>.</p> <p>The <code>subwin()</code> function creates a subwindow within window <i>orig</i>, with the specified number of lines and columns, and upper left corner positioned at <i>begin_x</i>, <i>begin_y</i> (relative to the physical screen, <i>not</i> to window <i>orig</i>). A pointer to the new window structure is returned.</p> <p>The original window and subwindow share character storage of the overlapping area (each window maintains its own pointers, cursor location, and other items). This means that characters and attributes are identical in overlapping areas regardless of which window characters are written to.</p> <p>When using subwindows, it is often necessary to call <code>touchwin(3XCURSES)</code> before <code>wrefresh(3XCURSES)</code> to maintain proper screen contents.</p> |             |                                                                    |               |                                          |              |                                            |                |                                                                                                     |
| <b>PARAMETERS</b>  | <table><tr><td><i>orig</i></td><td>Is a pointer to the parent window for the newly created subwindow.</td></tr><tr><td><i>nlines</i></td><td>Is the number of lines in the subwindow.</td></tr><tr><td><i>ncols</i></td><td>Is the number of columns in the subwindow.</td></tr><tr><td><i>begin_y</i></td><td>Is the y (row) coordinate of the upper left corner of the subwindow, relative to the parent window.</td></tr></table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <i>orig</i> | Is a pointer to the parent window for the newly created subwindow. | <i>nlines</i> | Is the number of lines in the subwindow. | <i>ncols</i> | Is the number of columns in the subwindow. | <i>begin_y</i> | Is the y (row) coordinate of the upper left corner of the subwindow, relative to the parent window. |
| <i>orig</i>        | Is a pointer to the parent window for the newly created subwindow.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |             |                                                                    |               |                                          |              |                                            |                |                                                                                                     |
| <i>nlines</i>      | Is the number of lines in the subwindow.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |             |                                                                    |               |                                          |              |                                            |                |                                                                                                     |
| <i>ncols</i>       | Is the number of columns in the subwindow.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |             |                                                                    |               |                                          |              |                                            |                |                                                                                                     |
| <i>begin_y</i>     | Is the y (row) coordinate of the upper left corner of the subwindow, relative to the parent window.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |             |                                                                    |               |                                          |              |                                            |                |                                                                                                     |

derwin(3XCURSES)

*begin\_x* Is the x (column) coordinate of the upper left corner of the subwindow, relative to the parent window.

**RETURN VALUES** On success, these functions return a pointer to the newly-created window. Otherwise, they return `ERR`.

**ERRORS** None.

**ATTRIBUTES** See `attributes(5)` for descriptions of the following attributes:

| ATTRIBUTE TYPE      | ATTRIBUTE VALUE |
|---------------------|-----------------|
| Interface Stability | Standard        |
| MT-Level            | Unsafe          |

**SEE ALSO** `douupdate(3XCURSES)`, `is_linetouched(3XCURSES)`, `libcurses(3XCURSES)`, `attributes(5)`, `standards(5)`

## doupdate(3XCURSES)

| <b>NAME</b>          | doupdate, refresh, wnoutrefresh, wrefresh – refresh windows and lines                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                |                 |                     |          |          |        |
|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-----------------|---------------------|----------|----------|--------|
| <b>SYNOPSIS</b>      | <pre>cc [ flag... ] file... -I /usr/xpg4/include -L /usr/xpg4/lib \ -R /usr/xpg4/lib -lcurses [ library... ]  c89 [ flag... ] file... -lcurses [ library... ]  #include &lt;curses.h&gt;  int doupdate(void);  int refresh(void);  int wnoutrefresh(WINDOW *win);  int wrefresh(WINDOW *win);</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                |                 |                     |          |          |        |
| <b>DESCRIPTION</b>   | <p>The <code>refresh()</code> and <code>wrefresh()</code> functions copy <code>stdscr</code> and <code>win</code>, respectively, to the terminal screen. These functions call the <code>wnoutrefresh()</code> function to copy the specified window to <code>curscr</code> and the <code>doupdate()</code> function to do the actual update. The physical cursor is mapped to the same position as the logical cursor of the last window to update <code>curscr</code> unless <code>leaveok(3XCURSES)</code> is enabled (in which case, the cursor is placed in a position that X/Open Curses finds convenient).</p> <p>When outputting several windows at once, it is often more efficient to call the <code>wnoutrefresh()</code> and <code>doupdate()</code> functions directly. A call to <code>wnoutrefresh()</code> for each window, followed by only one call to <code>doupdate()</code> to update the screen, results in one burst of output, fewer characters sent, and less CPU time used.</p> <p>If the <code>win</code> parameter to <code>wrefresh()</code> is the global variable <code>curscr</code>, the screen is immediately cleared and repainted from scratch.</p> <p>For details on how the <code>wnoutrefresh()</code> function handles overlapping windows with broad glyphs, see the <a href="#">Overlapping Windows</a> section of the <code>curses(3XCURSES)</code> reference manual page.</p> |                |                 |                     |          |          |        |
| <b>PARAMETERS</b>    | <p><i>win</i> Is a pointer to the window in which to refresh.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                |                 |                     |          |          |        |
| <b>RETURN VALUES</b> | On success, these functions return OK. Otherwise, they return ERR.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |                 |                     |          |          |        |
| <b>ERRORS</b>        | None.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                |                 |                     |          |          |        |
| <b>ATTRIBUTES</b>    | See <code>attributes(5)</code> for descriptions of the following attributes:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                |                 |                     |          |          |        |
|                      | <table border="1"><thead><tr><th>ATTRIBUTE TYPE</th><th>ATTRIBUTE VALUE</th></tr></thead><tbody><tr><td>Interface Stability</td><td>Standard</td></tr><tr><td>MT-Level</td><td>Unsafe</td></tr></tbody></table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | ATTRIBUTE TYPE | ATTRIBUTE VALUE | Interface Stability | Standard | MT-Level | Unsafe |
| ATTRIBUTE TYPE       | ATTRIBUTE VALUE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                |                 |                     |          |          |        |
| Interface Stability  | Standard                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                |                 |                     |          |          |        |
| MT-Level             | Unsafe                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                |                 |                     |          |          |        |
| <b>SEE ALSO</b>      | <code>clearok(3XCURSES)</code> , <code>curses(3XCURSES)</code> , <code>libcurses(3XCURSES)</code> , <code>prefresh(3XCURSES)</code> , <code>redrawwin(3XCURSES)</code> , <code>attributes(5)</code> , <code>standards(5)</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                |                 |                     |          |          |        |

**NAME** dupwin – duplicate a window

**SYNOPSIS**

```
cc [flag...] file... -I /usr/xpg4/include -L /usr/xpg4/lib \
-R /usr/xpg4/lib -lcurses [library...]

c89 [flag...] file... -lcurses [library...]

#include <curses.h>

WINDOW *dupwin (WINDOW *win) ;
```

**DESCRIPTION** The dupwin() function creates a duplicate of window *win*. A pointer to the new window structure is returned.

**PARAMETERS** *win* Is a pointer to the window that is to be duplicated.

**RETURN VALUES** On success, this function returns a pointer to new window structure; otherwise, it returns a null pointer.

**ERRORS** None.

**ATTRIBUTES** See attributes(5) for descriptions of the following attributes:

| ATTRIBUTE TYPE      | ATTRIBUTE VALUE |
|---------------------|-----------------|
| Interface Stability | Standard        |
| MT-Level            | Unsafe          |

**SEE ALSO** delwin(3XCURSES), derwin(3XCURSES), libcurses(3XCURSES), attributes(5), standards(5)

## echo(3XCURSES)

**NAME** echo, noecho – enable/disable terminal echo

**SYNOPSIS**

```
cc [flag...] file... -I /usr/xpg4/include -L /usr/xpg4/lib \
-R /usr/xpg4/lib -lcurses [library...]

c89 [flag...] file... -lcurses [library...]

#include <curses.h>

int echo(void);

int noecho(void);
```

**DESCRIPTION** The `echo()` function enables Echo mode for the current screen. The `noecho()` function disables Echo mode for the current screen. Initially, curses software echo mode is enabled and hardware echo mode of the `tty` driver is disabled. The `echo()` and `noecho()` functions control software echo only. Hardware echo must remain disabled for the duration of the application, else the behavior is undefined.

**RETURN VALUES** Upon successful completion, these functions return `OK`. Otherwise, they return `ERR`.

**ERRORS** No errors are defined.

**ATTRIBUTES** See `attributes(5)` for descriptions of the following attributes:

| ATTRIBUTE TYPE      | ATTRIBUTE VALUE |
|---------------------|-----------------|
| Interface Stability | Standard        |
| MT-Level            | Unsafe          |

**SEE ALSO** `getch(3XCURSES)`, `getstr(3XCURSES)`, `initscr(3XCURSES)`, `libcurses(3XCURSES)`, `scanw(3XCURSES)`, `attributes(5)`, `standards(5)`

| <b>NAME</b>          | echochar, wechochar – add a single-byte character and refresh window                                                                                                                                                                                                                                            |                |                 |                     |          |          |        |
|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-----------------|---------------------|----------|----------|--------|
| <b>SYNOPSIS</b>      | <pre>cc [ flag... ] file... -I /usr/xpg4/include -L /usr/xpg4/lib \ -R /usr/xpg4/lib -lcurses [ library... ]  c89 [ flag... ] file... -lcurses [ library... ]  #include &lt;curses.h&gt;  int <b>echochar</b>(const chtype <i>ch</i>);  int <b>wechochar</b>(WINDOW *<i>win</i>, const chtype <i>ch</i>);</pre> |                |                 |                     |          |          |        |
| <b>DESCRIPTION</b>   | The echochar() function produces the same effect as calling addch(3XCURSES) and then refresh(3XCURSES). The wechochar() function produces the same effect as calling waddch(3XCURSES) and then wrefresh(3XCURSES).                                                                                              |                |                 |                     |          |          |        |
| <b>PARAMETERS</b>    | <p><i>ch</i> Is a pointer to the character to be written to the window.</p> <p><i>win</i> Is a pointer to the window in which the character is to be added.</p>                                                                                                                                                 |                |                 |                     |          |          |        |
| <b>RETURN VALUES</b> | On success, these functions return OK. Otherwise, they return ERR.                                                                                                                                                                                                                                              |                |                 |                     |          |          |        |
| <b>ERRORS</b>        | None.                                                                                                                                                                                                                                                                                                           |                |                 |                     |          |          |        |
| <b>ATTRIBUTES</b>    | See attributes(5) for descriptions of the following attributes:                                                                                                                                                                                                                                                 |                |                 |                     |          |          |        |
|                      | <table border="1"> <thead> <tr> <th>ATTRIBUTE TYPE</th> <th>ATTRIBUTE VALUE</th> </tr> </thead> <tbody> <tr> <td>Interface Stability</td> <td>Standard</td> </tr> <tr> <td>MT-Level</td> <td>Unsafe</td> </tr> </tbody> </table>                                                                                | ATTRIBUTE TYPE | ATTRIBUTE VALUE | Interface Stability | Standard | MT-Level | Unsafe |
| ATTRIBUTE TYPE       | ATTRIBUTE VALUE                                                                                                                                                                                                                                                                                                 |                |                 |                     |          |          |        |
| Interface Stability  | Standard                                                                                                                                                                                                                                                                                                        |                |                 |                     |          |          |        |
| MT-Level             | Unsafe                                                                                                                                                                                                                                                                                                          |                |                 |                     |          |          |        |
| <b>SEE ALSO</b>      | addch(3XCURSES), douupdate(3XCURSES), echo_wchar(3XCURSES), libcurses(3XCURSES), attributes(5), standards(5)                                                                                                                                                                                                    |                |                 |                     |          |          |        |

## echo\_wchar(3XCURSES)

| <b>NAME</b>          | echo_wchar, wecho_wchar – add a complex character and refresh window                                                                                                                                                                                                                   |                |                 |                     |          |          |        |
|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-----------------|---------------------|----------|----------|--------|
| <b>SYNOPSIS</b>      | <pre>cc [ flag... ] file... -I /usr/xpg4/include -L /usr/xpg4/lib \ -R /usr/xpg4/lib -lcurses [ library... ]  c89 [ flag... ] file... -lcurses [ library... ]  #include &lt;curses.h&gt;  int echo_wchar(const cchar_t *wch);  int wecho_wchar(WINDOW *win, const cchar_t *wch);</pre> |                |                 |                     |          |          |        |
| <b>DESCRIPTION</b>   | The echo_wchar() function produces the same effect as calling add_wch(3XCURSES) and then refresh(3XCURSES). The wecho_wchar() function produces the same effect as calling wadd_wch(3XCURSES) and then wrefresh(3XCURSES).                                                             |                |                 |                     |          |          |        |
| <b>PARAMETERS</b>    | <i>wch</i> Is a pointer to the complex character to be written to the window.<br><i>win</i> Is a pointer to the window in which the character is to be added.                                                                                                                          |                |                 |                     |          |          |        |
| <b>RETURN VALUES</b> | On success, these functions return OK. Otherwise, they return ERR.                                                                                                                                                                                                                     |                |                 |                     |          |          |        |
| <b>ERRORS</b>        | None.                                                                                                                                                                                                                                                                                  |                |                 |                     |          |          |        |
| <b>ATTRIBUTES</b>    | See attributes(5) for descriptions of the following attributes:                                                                                                                                                                                                                        |                |                 |                     |          |          |        |
|                      | <table border="1"><thead><tr><th>ATTRIBUTE TYPE</th><th>ATTRIBUTE VALUE</th></tr></thead><tbody><tr><td>Interface Stability</td><td>Standard</td></tr><tr><td>MT-Level</td><td>Unsafe</td></tr></tbody></table>                                                                        | ATTRIBUTE TYPE | ATTRIBUTE VALUE | Interface Stability | Standard | MT-Level | Unsafe |
| ATTRIBUTE TYPE       | ATTRIBUTE VALUE                                                                                                                                                                                                                                                                        |                |                 |                     |          |          |        |
| Interface Stability  | Standard                                                                                                                                                                                                                                                                               |                |                 |                     |          |          |        |
| MT-Level             | Unsafe                                                                                                                                                                                                                                                                                 |                |                 |                     |          |          |        |
| <b>SEE ALSO</b>      | add_wch(3XCURSES), doupdate(3XCURSES), echochar(3XCURSES), libcurses(3XCURSES), attributes(5), standards(5)                                                                                                                                                                            |                |                 |                     |          |          |        |

| <b>NAME</b>          | endwin, isendwin – restore initial terminal environment                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                |                 |                     |          |          |        |
|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-----------------|---------------------|----------|----------|--------|
| <b>SYNOPSIS</b>      | <pre>cc [ flag... ] file... -I /usr/xpg4/include -L /usr/xpg4/lib \ -R /usr/xpg4/lib -lcurses [ library... ]  c89 [ flag... ] file... -lcurses [ library... ]  #include &lt;curses.h&gt;  int endwin(void);  bool isendwin(void);</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                |                 |                     |          |          |        |
| <b>DESCRIPTION</b>   | <p>The <code>endwin()</code> function restores the terminal after Curses activity by at least restoring the saved shell terminsl mode, flushing any output to the terminal, and moving the cursor to the first column of the last line of the screen. Refreshing a window resumes program mode. The application must call <code>endwin()</code> for each terminal being used before exiting. If <code>newterm(3XCURSES)</code> is called more than once for the same terminal, the first screen created must be the last one for which <code>endwin()</code> is called.</p> <p>The <code>isendiwin()</code> function indicates whether or not a screen has been refreshed since the last call to <code>endwin()</code>.</p> |                |                 |                     |          |          |        |
| <b>RETURN VALUES</b> | <p>Upon successful completion, the <code>endwin()</code> function returns OK. Otherwise, it returns ERR.</p> <p>The <code>isendwin()</code> function returns TRUE if <code>endwin()</code> has been called without any subsequent refresh. Otherwise, it returns FALSE.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                |                 |                     |          |          |        |
| <b>ERRORS</b>        | Non errors are defined.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                |                 |                     |          |          |        |
| <b>ATTRIBUTES</b>    | See <code>attributes(5)</code> for descriptions of the following attributes:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                |                 |                     |          |          |        |
|                      | <table border="1"> <thead> <tr> <th>ATTRIBUTE TYPE</th> <th>ATTRIBUTE VALUE</th> </tr> </thead> <tbody> <tr> <td>Interface Stability</td> <td>Standard</td> </tr> <tr> <td>MT-Level</td> <td>Unsafe</td> </tr> </tbody> </table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | ATTRIBUTE TYPE | ATTRIBUTE VALUE | Interface Stability | Standard | MT-Level | Unsafe |
| ATTRIBUTE TYPE       | ATTRIBUTE VALUE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                |                 |                     |          |          |        |
| Interface Stability  | Standard                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                |                 |                     |          |          |        |
| MT-Level             | Unsafe                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                |                 |                     |          |          |        |
| <b>SEE ALSO</b>      | <code>doupdate(3XCURSES)</code> , <code>libcurses(3XCURSES)</code> , <code>newterm(3XCURSES)</code> , <code>attributes(5)</code> , <code>standards(5)</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                |                 |                     |          |          |        |

## erasechar(3XCURSES)

| <b>NAME</b>          | erasechar, eraseswchar, killchar, killwchar – return current ERASE or KILL characters                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                |                 |                     |          |          |        |
|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-----------------|---------------------|----------|----------|--------|
| <b>SYNOPSIS</b>      | <pre>cc [ flag... ] file... -I /usr/xpg4/include -L /usr/xpg4/lib \ -R /usr/xpg4/lib -lcurses [ library... ]  c89 [ flag... ] file... -lcurses [ library... ]  #include &lt;curses.h&gt;  char <b>erasechar</b>(void);  int <b>eraseswchar</b>(wchar_t *ch);  char <b>killchar</b>(void);  int <b>killwchar</b>(wchar_t *ch);</pre>                                                                                                                                                                                                                                                                                                                    |                |                 |                     |          |          |        |
| <b>DESCRIPTION</b>   | <p>The <code>erasechar()</code> function returns the current ERASE character from the tty driver. This character is used to delete the previous character during keyboard input. The returned value can be used when including deletion capability in interactive programs.</p> <p>The <code>killchar()</code> function is similar to <code>erasechar()</code>. It returns the current KILL character.</p> <p>The <code>eraseswchar()</code> and <code>killwchar()</code> functions are similar to <code>erasechar()</code> and <code>killchar()</code> respectively, but store the ERASE or KILL character in the object pointed to by <i>ch</i>.</p> |                |                 |                     |          |          |        |
| <b>PARAMETERS</b>    | <p><i>ch</i> Is a pointer to a location where a character may be stored.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                |                 |                     |          |          |        |
| <b>RETURN VALUES</b> | <p>For <code>erasechar()</code> and <code>killchar()</code>, the terminal's current ERASE or KILL character is returned.</p> <p>On success, the <code>eraseswchar()</code> and <code>killwchar()</code> functions return OK. Otherwise, they return ERR.</p>                                                                                                                                                                                                                                                                                                                                                                                           |                |                 |                     |          |          |        |
| <b>ATTRIBUTES</b>    | See <code>attributes(5)</code> for descriptions of the following attributes:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                |                 |                     |          |          |        |
|                      | <table border="1"><thead><tr><th>ATTRIBUTE TYPE</th><th>ATTRIBUTE VALUE</th></tr></thead><tbody><tr><td>Interface Stability</td><td>Standard</td></tr><tr><td>MT-Level</td><td>Unsafe</td></tr></tbody></table>                                                                                                                                                                                                                                                                                                                                                                                                                                        | ATTRIBUTE TYPE | ATTRIBUTE VALUE | Interface Stability | Standard | MT-Level | Unsafe |
| ATTRIBUTE TYPE       | ATTRIBUTE VALUE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                |                 |                     |          |          |        |
| Interface Stability  | Standard                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                |                 |                     |          |          |        |
| MT-Level             | Unsafe                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                |                 |                     |          |          |        |
| <b>SEE ALSO</b>      | <code>getch(3XCURSES)</code> , <code>getstr(3XCURSES)</code> , <code>get_wch(3XCURSES)</code> , <code>libcurses(3XCURSES)</code> , <code>attributes(5)</code> , <code>standards(5)</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                |                 |                     |          |          |        |

| <b>NAME</b>          | filter – disable use of certain terminal capabilities                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                |                 |                     |          |          |        |
|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-----------------|---------------------|----------|----------|--------|
| <b>SYNOPSIS</b>      | <pre>cc [ flag... ] file... -I /usr/xpg4/include -L /usr/xpg4/lib \ -R /usr/xpg4/lib -lcurses [ library... ]  c89 [ flag... ] file... -lcurses [ library... ]  #include &lt;curses.h&gt;  void <b>filter</b>(void);</pre>                                                                                                                                                                                                                                                                                                                                      |                |                 |                     |          |          |        |
| <b>DESCRIPTION</b>   | <p>The <code>filter()</code> function changes how X/Open Curses initializes terminal capabilities that assume the terminal has more than one line. After a call to <code>filter()</code>, the <code>initscr(3XCURSES)</code> or <code>newterm(3XCURSES)</code> functions also:</p> <ul style="list-style-type: none"> <li>■ Disable use of <code>clear</code>, <code>cu</code>, <code>cu1</code>, <code>cup</code>, <code>cuu1</code>, and <code>vpa</code>.</li> <li>■ Set home string to the value of <code>cr</code>.</li> <li>■ Set lines to 1.</li> </ul> |                |                 |                     |          |          |        |
| <b>RETURN VALUES</b> | The <code>filter()</code> function does not return a value.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                |                 |                     |          |          |        |
| <b>ERRORS</b>        | None.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                |                 |                     |          |          |        |
| <b>ATTRIBUTES</b>    | See <code>attributes(5)</code> for descriptions of the following attributes:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                |                 |                     |          |          |        |
|                      | <table border="1"> <thead> <tr> <th>ATTRIBUTE TYPE</th> <th>ATTRIBUTE VALUE</th> </tr> </thead> <tbody> <tr> <td>Interface Stability</td> <td>Standard</td> </tr> <tr> <td>MT-Level</td> <td>Unsafe</td> </tr> </tbody> </table>                                                                                                                                                                                                                                                                                                                               | ATTRIBUTE TYPE | ATTRIBUTE VALUE | Interface Stability | Standard | MT-Level | Unsafe |
| ATTRIBUTE TYPE       | ATTRIBUTE VALUE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                |                 |                     |          |          |        |
| Interface Stability  | Standard                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |                 |                     |          |          |        |
| MT-Level             | Unsafe                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                |                 |                     |          |          |        |
| <b>SEE ALSO</b>      | <code>initscr(3XCURSES)</code> , <code>libcurses(3XCURSES)</code> , <code>newterm(3XCURSES)</code> , <code>attributes(5)</code> , <code>standards(5)</code>                                                                                                                                                                                                                                                                                                                                                                                                    |                |                 |                     |          |          |        |

## flushinp(3XCURSES)

**NAME** flushinp – discard type-ahead characters

**SYNOPSIS** `cc [ flag... ] file... -I /usr/xpg4/include -L /usr/xpg4/lib \  
-R /usr/xpg4/lib -lcurses [ library... ]`

`c89 [ flag... ] file... -lcurses [ library... ]`

```
#include <curses.h>
int flushinp(void);
```

**DESCRIPTION** The `flushinp()` function discards (flushes) any characters in the input buffer associated with the current screen.

**RETURN VALUES** The `flushinp()` function always returns OK.

**ERRORS** No errors are defined.

**ATTRIBUTES** See `attributes(5)` for descriptions of the following attributes:

| ATTRIBUTE TYPE      | ATTRIBUTE VALUE |
|---------------------|-----------------|
| Interface Stability | Standard        |
| MT-Level            | Unsafe          |

**SEE ALSO** `libcurses(3XCURSES)`, `attributes(5)`, `standards(5)`

**NAME** form\_cursor, pos\_form\_cursor – position forms window cursor

**SYNOPSIS**

```
cc [flag...] file... -lform -lcurses [library...]
#include <form.h>

int pos_form_cursor(FORM *form);
```

**DESCRIPTION** pos\_form\_cursor() moves the form window cursor to the location required by the form driver to resume form processing. This may be needed after the application calls a curses library I/O routine.

**RETURN VALUES** pos\_form\_cursor() returns one of the following:

|                |                                     |
|----------------|-------------------------------------|
| E_OK           | The function returned successfully. |
| E_SYSTEM_ERROR | System error.                       |
| E_BAD_ARGUMENT | An argument is incorrect.           |
| E_NOT_POSTED   | The form is not posted.             |

**ATTRIBUTES** See attributes(5) for descriptions of the following attributes:

| ATTRIBUTE TYPE | ATTRIBUTE VALUE |
|----------------|-----------------|
| MT-Level       | Unsafe          |

**SEE ALSO** curses(3CURSES), forms(3CURSES), attributes(5)

**NOTES** The header <form.h> automatically includes the headers <eti.h> and <curses.h>.

## form\_data(3CURSES)

| <b>NAME</b>        | form_data, data_ahead, data_behind – tell if forms field has off-screen data ahead or behind                                                                                                                                                          |                |                 |          |        |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-----------------|----------|--------|
| <b>SYNOPSIS</b>    | <pre>cc [ flag ... ] file ... -lform -lcurses [ library .. ] #include &lt;form.h&gt;  int data_ahead(FORM *form) ; int data_behind(FORM *form) ;</pre>                                                                                                |                |                 |          |        |
| <b>DESCRIPTION</b> | <p>data_ahead() returns TRUE (1) if the current field has more off-screen data ahead; otherwise it returns FALSE (0).</p> <p>data_behind() returns TRUE (1) if the current field has more off-screen data behind; otherwise it returns FALSE (0).</p> |                |                 |          |        |
| <b>ATTRIBUTES</b>  | See attributes(5) for descriptions of the following attributes:                                                                                                                                                                                       |                |                 |          |        |
|                    | <table border="1"><thead><tr><th>ATTRIBUTE TYPE</th><th>ATTRIBUTE VALUE</th></tr></thead><tbody><tr><td>MT-Level</td><td>Unsafe</td></tr></tbody></table>                                                                                             | ATTRIBUTE TYPE | ATTRIBUTE VALUE | MT-Level | Unsafe |
| ATTRIBUTE TYPE     | ATTRIBUTE VALUE                                                                                                                                                                                                                                       |                |                 |          |        |
| MT-Level           | Unsafe                                                                                                                                                                                                                                                |                |                 |          |        |
| <b>SEE ALSO</b>    | courses(3CURSES), forms(3CURSES), attributes(5)                                                                                                                                                                                                       |                |                 |          |        |
| <b>NOTES</b>       | The header <form.h> automatically includes the headers <eti.h> and <curses.h>.                                                                                                                                                                        |                |                 |          |        |

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |               |                        |               |                            |                |                         |               |                        |                |                         |                |                             |                 |                          |                |                         |                 |                                |                 |                                |                  |                                 |                 |                                |                |                     |                 |                      |              |                   |                |                     |               |                                          |               |                                              |               |                                     |               |                                         |               |                                     |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|------------------------|---------------|----------------------------|----------------|-------------------------|---------------|------------------------|----------------|-------------------------|----------------|-----------------------------|-----------------|--------------------------|----------------|-------------------------|-----------------|--------------------------------|-----------------|--------------------------------|------------------|---------------------------------|-----------------|--------------------------------|----------------|---------------------|-----------------|----------------------|--------------|-------------------|----------------|---------------------|---------------|------------------------------------------|---------------|----------------------------------------------|---------------|-------------------------------------|---------------|-----------------------------------------|---------------|-------------------------------------|
| <b>NAME</b>        | form_driver – command processor for the forms subsystem                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |               |                        |               |                            |                |                         |               |                        |                |                         |                |                             |                 |                          |                |                         |                 |                                |                 |                                |                  |                                 |                 |                                |                |                     |                 |                      |              |                   |                |                     |               |                                          |               |                                              |               |                                     |               |                                         |               |                                     |
| <b>SYNOPSIS</b>    | <pre>cc [ flag... ] file... -lform -lcurses [ library... ] #include &lt;form.h&gt;  int <b>form_driver</b>(FORM *form, int c);</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |               |                        |               |                            |                |                         |               |                        |                |                         |                |                             |                 |                          |                |                         |                 |                                |                 |                                |                  |                                 |                 |                                |                |                     |                 |                      |              |                   |                |                     |               |                                          |               |                                              |               |                                     |               |                                         |               |                                     |
| <b>DESCRIPTION</b> | <p>The <code>form_driver()</code> function is the workhorse of the forms subsystem; it checks to determine whether the character <code>c</code> is a forms request or data. If it is a request, the form driver executes the request and reports the result. If it is data (a printable ASCII character), it enters the data into the current position in the current field. If it is not recognized, the form driver assumes it is an application-defined command and returns <code>E_UNKNOWN_COMMAND</code>. Application defined commands should be defined relative to <code>MAX_COMMAND</code>, the maximum value of a request listed below.</p> <p>Form driver requests:</p> <table border="0"> <tr><td>REQ_NEXT_PAGE</td><td>Move to the next page.</td></tr> <tr><td>REQ_PREV_PAGE</td><td>Move to the previous page.</td></tr> <tr><td>REQ_FIRST_PAGE</td><td>Move to the first page.</td></tr> <tr><td>REQ_LAST_PAGE</td><td>Move to the last page.</td></tr> <tr><td>REQ_NEXT_FIELD</td><td>Move to the next field.</td></tr> <tr><td>REQ_PREV_FIELD</td><td>Move to the previous field.</td></tr> <tr><td>REQ_FIRST_FIELD</td><td>Move to the first field.</td></tr> <tr><td>REQ_LAST_FIELD</td><td>Move to the last field.</td></tr> <tr><td>REQ_SNEXT_FIELD</td><td>Move to the sorted next field.</td></tr> <tr><td>REQ_SPREV_FIELD</td><td>Move to the sorted prev field.</td></tr> <tr><td>REQ_SFIRST_FIELD</td><td>Move to the sorted first field.</td></tr> <tr><td>REQ_SLAST_FIELD</td><td>Move to the sorted last field.</td></tr> <tr><td>REQ_LEFT_FIELD</td><td>Move left to field.</td></tr> <tr><td>REQ_RIGHT_FIELD</td><td>Move right to field.</td></tr> <tr><td>REQ_UP_FIELD</td><td>Move up to field.</td></tr> <tr><td>REQ_DOWN_FIELD</td><td>Move down to field.</td></tr> <tr><td>REQ_NEXT_CHAR</td><td>Move to the next character in the field.</td></tr> <tr><td>REQ_PREV_CHAR</td><td>Move to the previous character in the field.</td></tr> <tr><td>REQ_NEXT_LINE</td><td>Move to the next line in the field.</td></tr> <tr><td>REQ_PREV_LINE</td><td>Move to the previous line in the field.</td></tr> <tr><td>REQ_NEXT_WORD</td><td>Move to the next word in the field.</td></tr> </table> | REQ_NEXT_PAGE | Move to the next page. | REQ_PREV_PAGE | Move to the previous page. | REQ_FIRST_PAGE | Move to the first page. | REQ_LAST_PAGE | Move to the last page. | REQ_NEXT_FIELD | Move to the next field. | REQ_PREV_FIELD | Move to the previous field. | REQ_FIRST_FIELD | Move to the first field. | REQ_LAST_FIELD | Move to the last field. | REQ_SNEXT_FIELD | Move to the sorted next field. | REQ_SPREV_FIELD | Move to the sorted prev field. | REQ_SFIRST_FIELD | Move to the sorted first field. | REQ_SLAST_FIELD | Move to the sorted last field. | REQ_LEFT_FIELD | Move left to field. | REQ_RIGHT_FIELD | Move right to field. | REQ_UP_FIELD | Move up to field. | REQ_DOWN_FIELD | Move down to field. | REQ_NEXT_CHAR | Move to the next character in the field. | REQ_PREV_CHAR | Move to the previous character in the field. | REQ_NEXT_LINE | Move to the next line in the field. | REQ_PREV_LINE | Move to the previous line in the field. | REQ_NEXT_WORD | Move to the next word in the field. |
| REQ_NEXT_PAGE      | Move to the next page.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |               |                        |               |                            |                |                         |               |                        |                |                         |                |                             |                 |                          |                |                         |                 |                                |                 |                                |                  |                                 |                 |                                |                |                     |                 |                      |              |                   |                |                     |               |                                          |               |                                              |               |                                     |               |                                         |               |                                     |
| REQ_PREV_PAGE      | Move to the previous page.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |               |                        |               |                            |                |                         |               |                        |                |                         |                |                             |                 |                          |                |                         |                 |                                |                 |                                |                  |                                 |                 |                                |                |                     |                 |                      |              |                   |                |                     |               |                                          |               |                                              |               |                                     |               |                                         |               |                                     |
| REQ_FIRST_PAGE     | Move to the first page.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |               |                        |               |                            |                |                         |               |                        |                |                         |                |                             |                 |                          |                |                         |                 |                                |                 |                                |                  |                                 |                 |                                |                |                     |                 |                      |              |                   |                |                     |               |                                          |               |                                              |               |                                     |               |                                         |               |                                     |
| REQ_LAST_PAGE      | Move to the last page.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |               |                        |               |                            |                |                         |               |                        |                |                         |                |                             |                 |                          |                |                         |                 |                                |                 |                                |                  |                                 |                 |                                |                |                     |                 |                      |              |                   |                |                     |               |                                          |               |                                              |               |                                     |               |                                         |               |                                     |
| REQ_NEXT_FIELD     | Move to the next field.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |               |                        |               |                            |                |                         |               |                        |                |                         |                |                             |                 |                          |                |                         |                 |                                |                 |                                |                  |                                 |                 |                                |                |                     |                 |                      |              |                   |                |                     |               |                                          |               |                                              |               |                                     |               |                                         |               |                                     |
| REQ_PREV_FIELD     | Move to the previous field.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |               |                        |               |                            |                |                         |               |                        |                |                         |                |                             |                 |                          |                |                         |                 |                                |                 |                                |                  |                                 |                 |                                |                |                     |                 |                      |              |                   |                |                     |               |                                          |               |                                              |               |                                     |               |                                         |               |                                     |
| REQ_FIRST_FIELD    | Move to the first field.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |               |                        |               |                            |                |                         |               |                        |                |                         |                |                             |                 |                          |                |                         |                 |                                |                 |                                |                  |                                 |                 |                                |                |                     |                 |                      |              |                   |                |                     |               |                                          |               |                                              |               |                                     |               |                                         |               |                                     |
| REQ_LAST_FIELD     | Move to the last field.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |               |                        |               |                            |                |                         |               |                        |                |                         |                |                             |                 |                          |                |                         |                 |                                |                 |                                |                  |                                 |                 |                                |                |                     |                 |                      |              |                   |                |                     |               |                                          |               |                                              |               |                                     |               |                                         |               |                                     |
| REQ_SNEXT_FIELD    | Move to the sorted next field.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |               |                        |               |                            |                |                         |               |                        |                |                         |                |                             |                 |                          |                |                         |                 |                                |                 |                                |                  |                                 |                 |                                |                |                     |                 |                      |              |                   |                |                     |               |                                          |               |                                              |               |                                     |               |                                         |               |                                     |
| REQ_SPREV_FIELD    | Move to the sorted prev field.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |               |                        |               |                            |                |                         |               |                        |                |                         |                |                             |                 |                          |                |                         |                 |                                |                 |                                |                  |                                 |                 |                                |                |                     |                 |                      |              |                   |                |                     |               |                                          |               |                                              |               |                                     |               |                                         |               |                                     |
| REQ_SFIRST_FIELD   | Move to the sorted first field.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |               |                        |               |                            |                |                         |               |                        |                |                         |                |                             |                 |                          |                |                         |                 |                                |                 |                                |                  |                                 |                 |                                |                |                     |                 |                      |              |                   |                |                     |               |                                          |               |                                              |               |                                     |               |                                         |               |                                     |
| REQ_SLAST_FIELD    | Move to the sorted last field.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |               |                        |               |                            |                |                         |               |                        |                |                         |                |                             |                 |                          |                |                         |                 |                                |                 |                                |                  |                                 |                 |                                |                |                     |                 |                      |              |                   |                |                     |               |                                          |               |                                              |               |                                     |               |                                         |               |                                     |
| REQ_LEFT_FIELD     | Move left to field.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |               |                        |               |                            |                |                         |               |                        |                |                         |                |                             |                 |                          |                |                         |                 |                                |                 |                                |                  |                                 |                 |                                |                |                     |                 |                      |              |                   |                |                     |               |                                          |               |                                              |               |                                     |               |                                         |               |                                     |
| REQ_RIGHT_FIELD    | Move right to field.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |               |                        |               |                            |                |                         |               |                        |                |                         |                |                             |                 |                          |                |                         |                 |                                |                 |                                |                  |                                 |                 |                                |                |                     |                 |                      |              |                   |                |                     |               |                                          |               |                                              |               |                                     |               |                                         |               |                                     |
| REQ_UP_FIELD       | Move up to field.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |               |                        |               |                            |                |                         |               |                        |                |                         |                |                             |                 |                          |                |                         |                 |                                |                 |                                |                  |                                 |                 |                                |                |                     |                 |                      |              |                   |                |                     |               |                                          |               |                                              |               |                                     |               |                                         |               |                                     |
| REQ_DOWN_FIELD     | Move down to field.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |               |                        |               |                            |                |                         |               |                        |                |                         |                |                             |                 |                          |                |                         |                 |                                |                 |                                |                  |                                 |                 |                                |                |                     |                 |                      |              |                   |                |                     |               |                                          |               |                                              |               |                                     |               |                                         |               |                                     |
| REQ_NEXT_CHAR      | Move to the next character in the field.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |               |                        |               |                            |                |                         |               |                        |                |                         |                |                             |                 |                          |                |                         |                 |                                |                 |                                |                  |                                 |                 |                                |                |                     |                 |                      |              |                   |                |                     |               |                                          |               |                                              |               |                                     |               |                                         |               |                                     |
| REQ_PREV_CHAR      | Move to the previous character in the field.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |               |                        |               |                            |                |                         |               |                        |                |                         |                |                             |                 |                          |                |                         |                 |                                |                 |                                |                  |                                 |                 |                                |                |                     |                 |                      |              |                   |                |                     |               |                                          |               |                                              |               |                                     |               |                                         |               |                                     |
| REQ_NEXT_LINE      | Move to the next line in the field.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |               |                        |               |                            |                |                         |               |                        |                |                         |                |                             |                 |                          |                |                         |                 |                                |                 |                                |                  |                                 |                 |                                |                |                     |                 |                      |              |                   |                |                     |               |                                          |               |                                              |               |                                     |               |                                         |               |                                     |
| REQ_PREV_LINE      | Move to the previous line in the field.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |               |                        |               |                            |                |                         |               |                        |                |                         |                |                             |                 |                          |                |                         |                 |                                |                 |                                |                  |                                 |                 |                                |                |                     |                 |                      |              |                   |                |                     |               |                                          |               |                                              |               |                                     |               |                                         |               |                                     |
| REQ_NEXT_WORD      | Move to the next word in the field.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |               |                        |               |                            |                |                         |               |                        |                |                         |                |                             |                 |                          |                |                         |                 |                                |                 |                                |                  |                                 |                 |                                |                |                     |                 |                      |              |                   |                |                     |               |                                          |               |                                              |               |                                     |               |                                         |               |                                     |

form\_driver(3CURSES)

|                |                                           |
|----------------|-------------------------------------------|
| REQ_PREV_WORD  | Move to the previous word in the field.   |
| REQ_BEG_FIELD  | Move to the first char in the field.      |
| REQ_END_FIELD  | Move after the last char in the field.    |
| REQ_BEG_LINE   | Move to the beginning of the line.        |
| REQ_END_LINE   | Move after the last char in the line.     |
| REQ_LEFT_CHAR  | Move left in the field.                   |
| REQ_RIGHT_CHAR | Move right in the field.                  |
| REQ_UP_CHAR    | Move up in the field.                     |
| REQ_DOWN_CHAR  | Move down in the field.                   |
| REQ_NEW_LINE   | Insert/overlay a new line.                |
| REQ_INS_CHAR   | Insert the blank character at the cursor. |
| REQ_INS_LINE   | Insert a blank line at the cursor.        |
| REQ_DEL_CHAR   | Delete the character at the cursor.       |
| REQ_DEL_PREV   | Delete the character before the cursor.   |
| REQ_DEL_LINE   | Delete the line at the cursor.            |
| REQ_DEL_WORD   | Delete the word at the cursor.            |
| REQ_CLR_EOL    | Clear to the end of the line.             |
| REQ_CLR_EOF    | Clear to the end of the field.            |
| REQ_CLR_FIELD  | Clear the entire field.                   |
| REQ_OVL_MODE   | Enter overlay mode.                       |
| REQ_INS_MODE   | Enter insert mode.                        |
| REQ_SCR_FLINE  | Scroll the field forward a line.          |
| REQ_SCR_BLINE  | Scroll the field backward a line.         |
| REQ_SCR_FPAGE  | Scroll the field forward a page.          |
| REQ_SCR_BPAGE  | Scroll the field backward a page.         |
| REQ_SCR_FHPAGE | Scroll the field forward half a page.     |
| REQ_SCR_BHPAGE | Scroll the field backward half a page.    |
| REQ_SCR_FCHAR  | Horizontal scroll forward a character.    |
| REQ_SCR_BCHAR  | Horizontal scroll backward a character.   |
| REQ_SCR_HFLINE | Horizontal scroll forward a line.         |
| REQ_SCR_HBLINE | Horizontal scroll backward a line.        |

form\_driver(3CURSES)

REQ\_SCR\_HFHALL Horizontal scroll forward half a line.  
REQ\_SCR\_HBHALF Horizontal scroll backward half a line.  
REQ\_VALIDATION Validate field.  
REQ\_PREV\_CHOICE Display the previous field choice.  
REQ\_NEXT\_CHOICE Display the next field choice.

**RETURN VALUES**

The `form_driver()` function returns one of the following:

E\_OK The function returned successfully.  
E\_SYSTEM\_ERROR System error.  
E\_BAD\_ARGUMENT An argument is incorrect.  
E\_NOT\_POSTED The form is not posted.  
E\_INVALID\_FIELD The field contents are invalid.  
E\_BAD\_STATE The routine was called from an initialization or termination function.  
E\_REQUEST\_DENIED The form driver request failed.  
E\_UNKNOWN\_COMMAND An unknown request was passed to the form driver.

**ATTRIBUTES**

See `attributes(5)` for descriptions of the following attributes:

| ATTRIBUTE TYPE | ATTRIBUTE VALUE |
|----------------|-----------------|
| MT-Level       | Unsafe          |

**SEE ALSO**

`curses(3CURSES)`, `forms(3CURSES)`, `attributes(5)`

**NOTES**

The header `<form.h>` automatically includes the headers `<eti.h>` and `<curses.h>`.

## form\_field(3CURSES)

| <b>NAME</b>          | form_field, set_form_fields, form_fields, field_count, move_field – connect fields to forms                                                                                                                                                                                                                                                                                                                                                                                                                |                |                                     |             |                                           |                |               |                |                          |          |                     |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------------------------------------|-------------|-------------------------------------------|----------------|---------------|----------------|--------------------------|----------|---------------------|
| <b>SYNOPSIS</b>      | <pre>cc [ flag... ] file... -lform -lcurses [ library... ] #include &lt;form.h&gt;  int set_form_fields(FORM *form, FIELD **field); FIELD **form_fields(FORM *form); int field_count(FORM *form); int move_field(FIELD *field, int frow, int fcol);</pre>                                                                                                                                                                                                                                                  |                |                                     |             |                                           |                |               |                |                          |          |                     |
| <b>DESCRIPTION</b>   | <p>set_form_fields() changes the fields connected to <i>form</i> to <i>fields</i>. The original fields are disconnected.</p> <p>form_fields() returns a pointer to the field pointer array connected to <i>form</i>.</p> <p>field_count() returns the number of fields connected to <i>form</i>.</p> <p>move_field() moves the disconnected <i>field</i> to the location <i>frow</i>, <i>fcol</i> in the forms subwindow.</p>                                                                              |                |                                     |             |                                           |                |               |                |                          |          |                     |
| <b>RETURN VALUES</b> | <p>form_fields() returns NULL on error.</p> <p>field_count() returns -1 on error.</p> <p>set_form_fields() and move_field() return one of the following:</p> <table><tr><td>E_OK</td><td>The function returned successfully.</td></tr><tr><td>E_CONNECTED</td><td>The field is already connected to a form.</td></tr><tr><td>E_SYSTEM_ERROR</td><td>System error.</td></tr><tr><td>E_BAD_ARGUMENT</td><td>An argument is incorrect</td></tr><tr><td>E_POSTED</td><td>The form is posted.</td></tr></table> | E_OK           | The function returned successfully. | E_CONNECTED | The field is already connected to a form. | E_SYSTEM_ERROR | System error. | E_BAD_ARGUMENT | An argument is incorrect | E_POSTED | The form is posted. |
| E_OK                 | The function returned successfully.                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                |                                     |             |                                           |                |               |                |                          |          |                     |
| E_CONNECTED          | The field is already connected to a form.                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                |                                     |             |                                           |                |               |                |                          |          |                     |
| E_SYSTEM_ERROR       | System error.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                |                                     |             |                                           |                |               |                |                          |          |                     |
| E_BAD_ARGUMENT       | An argument is incorrect                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                |                                     |             |                                           |                |               |                |                          |          |                     |
| E_POSTED             | The form is posted.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                |                                     |             |                                           |                |               |                |                          |          |                     |
| <b>ATTRIBUTES</b>    | See attributes(5) for descriptions of the following attributes:                                                                                                                                                                                                                                                                                                                                                                                                                                            |                |                                     |             |                                           |                |               |                |                          |          |                     |
|                      | <table border="1"><thead><tr><th>ATTRIBUTE TYPE</th><th>ATTRIBUTE VALUE</th></tr></thead><tbody><tr><td>MT-Level</td><td>Unsafe</td></tr></tbody></table>                                                                                                                                                                                                                                                                                                                                                  | ATTRIBUTE TYPE | ATTRIBUTE VALUE                     | MT-Level    | Unsafe                                    |                |               |                |                          |          |                     |
| ATTRIBUTE TYPE       | ATTRIBUTE VALUE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                |                                     |             |                                           |                |               |                |                          |          |                     |
| MT-Level             | Unsafe                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                |                                     |             |                                           |                |               |                |                          |          |                     |
| <b>SEE ALSO</b>      | curses(3CURSES), forms(3CURSES), attributes(5)                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                |                                     |             |                                           |                |               |                |                          |          |                     |
| <b>NOTES</b>         | The header <form.h> automatically includes the headers <eti.h> and <curses.h>.                                                                                                                                                                                                                                                                                                                                                                                                                             |                |                                     |             |                                           |                |               |                |                          |          |                     |

**NAME** form\_field\_attributes, set\_field\_fore, field\_fore, set\_field\_back, field\_back, set\_field\_pad, field\_pad – format the general display attributes of forms

**SYNOPSIS**

```
cc [flag...] file... -lform -lcurses [library...]
#include <form.h>

int set_field_fore(FIELD *field, chtype attr);
chtype field_fore(FIELD *field);

int set_field_back(FIELD *field, chtype attr);
chtype field_back(FIELD *field);

int set_field_pad(FIELD *field, int pad);
int field_pad(FIELD *field);
```

**DESCRIPTION**

set\_field\_fore() sets the foreground attribute of *field*. The foreground attribute is the low-level curses display attribute used to display the field contents. field\_fore() returns the foreground attribute of *field*.

set\_field\_back() sets the background attribute of *field*. The background attribute is the low-level curses display attribute used to display the extent of the field. field\_back() returns the background attribute of *field*.

set\_field\_pad() sets the pad character of *field* to *pad*. The pad character is the character used to fill within the field. field\_pad() returns the pad character of *field*.

**RETURN VALUES**

field\_fore(), field\_back(), and field\_pad() return default values if *field* is NULL. If *field* is not NULL and is not a valid FIELD pointer, the return value from these routines is undefined.

set\_field\_fore(), set\_field\_back(), and set\_field\_pad() return one of the following:

|                |                                     |
|----------------|-------------------------------------|
| E_OK           | The function returned successfully. |
| E_SYSTEM_ERROR | System error.                       |
| E_BAD_ARGUMENT | An argument is incorrect.           |

**ATTRIBUTES** See attributes(5) for descriptions of the following attributes:

| ATTRIBUTE TYPE | ATTRIBUTE VALUE |
|----------------|-----------------|
| MT-Level       | Unsafe          |

**SEE ALSO** curses(3CURSES), forms(3CURSES), attributes(5)

**NOTES** The header <form.h> automatically includes the headers <eti.h> and <curses.h>.



**NAME** form\_field\_info, field\_info, dynamic\_field\_info – get forms field characteristics

**SYNOPSIS**

```
cc [flag...] file... -lform -lcurses [library...]
#include <form.h>

int field_info(FIELD *field, int *rows, int *cols, int *frow, int *fcol,
 int *nrow, int *nbuf);

int dynamic_field_info(FIELD *field, int *drows, int *dcols, int
 *max);
```

**DESCRIPTION**

field\_info() returns the size, position, and other named field characteristics, as defined in the original call to new\_field(), to the locations pointed to by the arguments rows, cols, frow, fcol, nrow, and nbuf.

dynamic\_field\_info() returns the actual size of the field in the pointer arguments drows, dcols and returns the maximum growth allowed for field in max. If no maximum growth limit is specified for field, max will contain 0. A field can be made dynamic by turning off the field option O\_STATIC.

**RETURN VALUES** These routines return one of the following:

|                |                                     |
|----------------|-------------------------------------|
| E_OK           | The function returned successfully. |
| E_SYSTEM_ERROR | System error.                       |
| E_BAD_ARGUMENT | An argument is incorrect.           |

**ATTRIBUTES** See attributes(5) for descriptions of the following attributes:

| ATTRIBUTE TYPE | ATTRIBUTE VALUE |
|----------------|-----------------|
| MT-Level       | Unsafe          |

**SEE ALSO** curses(3CURSES), forms(3CURSES), attributes(5)

**NOTES** The header <form.h> automatically includes the headers <eti.h> and <curses.h>.

## form\_field\_just(3CURSES)

| <b>NAME</b>          | form_field_just, set_field_just, field_just – format the general appearance of forms                                                                                                                                                                                                                                                                                                                 |                |                 |          |        |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-----------------|----------|--------|
| <b>SYNOPSIS</b>      | <pre>cc [ flag... ] file... -lform -lcurses [ library... ] #include &lt;form.h&gt;  int set_field_just(FIELD *field, int justification); int field_just(FIELD *field);</pre>                                                                                                                                                                                                                         |                |                 |          |        |
| <b>DESCRIPTION</b>   | <p>set_field_just() sets the justification for <i>field</i>. Justification may be one of:</p> <p>NO_JUSTIFICATION<br/>JUSTIFY_RIGHT<br/>JUSTIFY_LEFT<br/>JUSTIFY_CENTER</p> <p>.</p> <p>The field justification will be ignored if <i>field</i> is a dynamic field.</p> <p>field_just() returns the type of justification assigned to <i>field</i>.</p>                                              |                |                 |          |        |
| <b>RETURN VALUES</b> | <p>field_just() returns one of the following:</p> <p>NO_JUSTIFICATION<br/>JUSTIFY_RIGHT<br/>JUSTIFY_LEFT<br/>JUSTIFY_CENTER.</p> <p>set_field_just() returns one of the following:</p> <p>E_OK                                   The function returned successfully.<br/>E_SYSTEM_ERROR                        System error.<br/>E_BAD_ARGUMENT                        An argument is incorrect.</p> |                |                 |          |        |
| <b>ATTRIBUTES</b>    | <p>See attributes(5) for descriptions of the following attributes:</p> <table border="1"><thead><tr><th>ATTRIBUTE TYPE</th><th>ATTRIBUTE VALUE</th></tr></thead><tbody><tr><td>MT-Level</td><td>Unsafe</td></tr></tbody></table>                                                                                                                                                                     | ATTRIBUTE TYPE | ATTRIBUTE VALUE | MT-Level | Unsafe |
| ATTRIBUTE TYPE       | ATTRIBUTE VALUE                                                                                                                                                                                                                                                                                                                                                                                      |                |                 |          |        |
| MT-Level             | Unsafe                                                                                                                                                                                                                                                                                                                                                                                               |                |                 |          |        |
| <b>SEE ALSO</b>      | curses(3CURSES), forms(3CURSES), attributes(5)                                                                                                                                                                                                                                                                                                                                                       |                |                 |          |        |
| <b>NOTES</b>         | The header <form.h> automatically includes the headers <eti.h> and <curses.h>.                                                                                                                                                                                                                                                                                                                       |                |                 |          |        |

form\_field\_new(3CURSES)

**NAME** form\_field\_new, new\_field, dup\_field, link\_field, free\_field – create and destroy forms fields

**SYNOPSIS**

```
cc [flag...] file... -lform -lcurses [library...]
#include <form.h>

FIELD *new_field(int r, int c, int frow, int fcol, int nrow, int ncol);
FIELD *dup_field(FIELD *field, int frow, int fcol);
FIELD *link_field(FIELD *field, int frow, int fcol);
int free_field(FIELD *field);
```

**DESCRIPTION** new\_field() creates a new field with *r* rows and *c* columns, starting at *frow*, *fcol*, in the subwindow of a form. *nrow* is the number of off-screen rows and *nbuf* is the number of additional working buffers. This routine returns a pointer to the new field.

dup\_field() duplicates *field* at the specified location. All field attributes are duplicated, including the current contents of the field buffers.

link\_field() also duplicates *field* at the specified location. However, unlike dup\_field(), the new field shares the field buffers with the original field. After creation, the attributes of the new field can be changed without affecting the original field.

free\_field() frees the storage allocated for *field*.

**RETURN VALUES** Routines that return pointers return NULL on error. free\_field() returns one of the following:

|                |                                           |
|----------------|-------------------------------------------|
| E_OK           | The function returned successfully.       |
| E_CONNECTED    | The field is already connected to a form. |
| E_SYSTEM_ERROR | System error.                             |
| E_BAD_ARGUMENT | An argument is incorrect.                 |

**ATTRIBUTES** See attributes(5) for descriptions of the following attributes:

| ATTRIBUTE TYPE | ATTRIBUTE VALUE |
|----------------|-----------------|
| MT-Level       | Unsafe          |

**SEE ALSO** curses(3CURSES), forms(3CURSES), attributes(5)

**NOTES** The header <form.h> automatically includes the headers <eti.h> and <curses.h>.

## form\_field\_opts(3CURSES)

|                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |           |                                     |                |                                         |           |                                                      |        |                          |        |                                                           |         |                                                                             |            |                                                             |          |                                    |          |                                      |          |                                          |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-------------------------------------|----------------|-----------------------------------------|-----------|------------------------------------------------------|--------|--------------------------|--------|-----------------------------------------------------------|---------|-----------------------------------------------------------------------------|------------|-------------------------------------------------------------|----------|------------------------------------|----------|--------------------------------------|----------|------------------------------------------|
| <b>NAME</b>          | form_field_opts, set_field_opts, field_opts_on, field_opts_off, field_opts – forms field option routines                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |           |                                     |                |                                         |           |                                                      |        |                          |        |                                                           |         |                                                                             |            |                                                             |          |                                    |          |                                      |          |                                          |
| <b>SYNOPSIS</b>      | <pre>cc [ flag... ] file... -lform -lcurses [ library... ] #include &lt;form.h&gt;  int set_field_opts(FIELD *field, OPTIONS opts); int set_field_opts(FIELD *field, OPTIONS opts); int field_opts_on(FIELD *field, OPTIONS opts); int field_opts_off(FIELD *field, OPTIONS opts); OPTIONS field_opts(FIELD *field);</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |           |                                     |                |                                         |           |                                                      |        |                          |        |                                                           |         |                                                                             |            |                                                             |          |                                    |          |                                      |          |                                          |
| <b>DESCRIPTION</b>   | <p>set_field_opts() turns on the named options of <i>field</i> and turns off all remaining options. Options are boolean values that can be OR-ed together.</p> <p>field_opts_on() turns on the named options; no other options are changed.</p> <p>field_opts_off() turns off the named options; no other options are changed.</p> <p>field_opts() returns the options set for <i>field</i>.</p> <table><tr><td>O_VISIBLE</td><td>The field is displayed.</td></tr><tr><td>O_ACTIVE</td><td>The field is visited during processing.</td></tr><tr><td>O_PUBLIC</td><td>The field contents are displayed as data is entered.</td></tr><tr><td>O_EDIT</td><td>The field can be edited.</td></tr><tr><td>O_WRAP</td><td>Words not fitting on a line are wrapped to the next line.</td></tr><tr><td>O_BLANK</td><td>The whole field is cleared if a character is entered in the first position.</td></tr><tr><td>O_AUTOSKIP</td><td>Skip to the next field when the current field becomes full.</td></tr><tr><td>O_NULLOK</td><td>A blank field is considered valid.</td></tr><tr><td>O_STATIC</td><td>The field buffers are fixed in size.</td></tr><tr><td>O_PASSOK</td><td>Validate field only if modified by user.</td></tr></table> | O_VISIBLE | The field is displayed.             | O_ACTIVE       | The field is visited during processing. | O_PUBLIC  | The field contents are displayed as data is entered. | O_EDIT | The field can be edited. | O_WRAP | Words not fitting on a line are wrapped to the next line. | O_BLANK | The whole field is cleared if a character is entered in the first position. | O_AUTOSKIP | Skip to the next field when the current field becomes full. | O_NULLOK | A blank field is considered valid. | O_STATIC | The field buffers are fixed in size. | O_PASSOK | Validate field only if modified by user. |
| O_VISIBLE            | The field is displayed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |           |                                     |                |                                         |           |                                                      |        |                          |        |                                                           |         |                                                                             |            |                                                             |          |                                    |          |                                      |          |                                          |
| O_ACTIVE             | The field is visited during processing.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |           |                                     |                |                                         |           |                                                      |        |                          |        |                                                           |         |                                                                             |            |                                                             |          |                                    |          |                                      |          |                                          |
| O_PUBLIC             | The field contents are displayed as data is entered.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |           |                                     |                |                                         |           |                                                      |        |                          |        |                                                           |         |                                                                             |            |                                                             |          |                                    |          |                                      |          |                                          |
| O_EDIT               | The field can be edited.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |           |                                     |                |                                         |           |                                                      |        |                          |        |                                                           |         |                                                                             |            |                                                             |          |                                    |          |                                      |          |                                          |
| O_WRAP               | Words not fitting on a line are wrapped to the next line.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |           |                                     |                |                                         |           |                                                      |        |                          |        |                                                           |         |                                                                             |            |                                                             |          |                                    |          |                                      |          |                                          |
| O_BLANK              | The whole field is cleared if a character is entered in the first position.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |           |                                     |                |                                         |           |                                                      |        |                          |        |                                                           |         |                                                                             |            |                                                             |          |                                    |          |                                      |          |                                          |
| O_AUTOSKIP           | Skip to the next field when the current field becomes full.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |           |                                     |                |                                         |           |                                                      |        |                          |        |                                                           |         |                                                                             |            |                                                             |          |                                    |          |                                      |          |                                          |
| O_NULLOK             | A blank field is considered valid.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |           |                                     |                |                                         |           |                                                      |        |                          |        |                                                           |         |                                                                             |            |                                                             |          |                                    |          |                                      |          |                                          |
| O_STATIC             | The field buffers are fixed in size.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |           |                                     |                |                                         |           |                                                      |        |                          |        |                                                           |         |                                                                             |            |                                                             |          |                                    |          |                                      |          |                                          |
| O_PASSOK             | Validate field only if modified by user.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |           |                                     |                |                                         |           |                                                      |        |                          |        |                                                           |         |                                                                             |            |                                                             |          |                                    |          |                                      |          |                                          |
| <b>RETURN VALUES</b> | <p>set_field_opts, field_opts_on and field_opts_off return one of the following:</p> <table><tr><td>E_OK</td><td>The function returned successfully.</td></tr><tr><td>E_SYSTEM_ERROR</td><td>System error.</td></tr><tr><td>E_CURRENT</td><td>The field is the current field.</td></tr></table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | E_OK      | The function returned successfully. | E_SYSTEM_ERROR | System error.                           | E_CURRENT | The field is the current field.                      |        |                          |        |                                                           |         |                                                                             |            |                                                             |          |                                    |          |                                      |          |                                          |
| E_OK                 | The function returned successfully.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |           |                                     |                |                                         |           |                                                      |        |                          |        |                                                           |         |                                                                             |            |                                                             |          |                                    |          |                                      |          |                                          |
| E_SYSTEM_ERROR       | System error.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |           |                                     |                |                                         |           |                                                      |        |                          |        |                                                           |         |                                                                             |            |                                                             |          |                                    |          |                                      |          |                                          |
| E_CURRENT            | The field is the current field.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |           |                                     |                |                                         |           |                                                      |        |                          |        |                                                           |         |                                                                             |            |                                                             |          |                                    |          |                                      |          |                                          |

`form_field_opts(3CURSES)`

**ATTRIBUTES** See `attributes(5)` for descriptions of the following attributes:

| ATTRIBUTE TYPE | ATTRIBUTE VALUE |
|----------------|-----------------|
| MT-Level       | Unsafe          |

**SEE ALSO** `curses(3CURSES)`, `forms(3CURSES)`, `attributes(5)`

**NOTES** The header `<form.h>` automatically includes the headers `<eti.h>` and `<curses.h>`.

## form\_fieldtype(3CURSES)

|                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                   |                                     |                             |               |                             |                           |                          |                                          |
|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-------------------------------------|-----------------------------|---------------|-----------------------------|---------------------------|--------------------------|------------------------------------------|
| <b>NAME</b>                 | form_fieldtype, new_fieldtype, free_fieldtype, set_fieldtype_arg, set_fieldtype_choice, link_fieldtype – forms fieldtype routines                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                   |                                     |                             |               |                             |                           |                          |                                          |
| <b>SYNOPSIS</b>             | <pre>cc [ flag... ] file... -lform -lcurses [ library... ] #include &lt;form.h&gt;  FIELDTYPE *new_fieldtype(int (* field_check)(FIELD *, char *), int     (*char_check)(int, char *));  int free_fieldtype(FIELDTYPE *fieldtype);  int set_fieldtype_arg(FIELDTYPE *fieldtype, char *(* mak_arg)(va_list     *), char *(* copy_arg)(char *), void (* free_arg)(char *));  int set_fieldtype_choice(FIELDTYPE *fieldtype, int (*     next_choice)(FIELD *, char *), int (*prev_choice)(FIELD *, char     *));  FIELDTYPE *link_fieldtype(FIELDTYPE *type1, FIELDTYPE *type2);</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |                                     |                             |               |                             |                           |                          |                                          |
| <b>DESCRIPTION</b>          | <p><code>new_fieldtype()</code> creates a new field type. The application programmer must write the function <code>field_check</code>, which validates the field value, and the function <code>char_check</code>, which validates each character. <code>free_fieldtype()</code> frees the space allocated for the field type.</p> <p>By associating function pointers with a field type, <code>set_fieldtype_arg()</code> connects to the field type additional arguments necessary for a <code>set_field_type()</code> call. Function <code>mak_arg</code> allocates a structure for the field specific parameters to <code>set_field_type()</code> and returns a pointer to the saved data. Function <code>copy_arg</code> duplicates the structure created by <code>make_arg</code>. Function <code>free_arg</code> frees any storage allocated by <code>make_arg</code> or <code>copy_arg</code>.</p> <p>The <code>form_driver()</code> requests <code>REQ_NEXT_CHOICE</code> and <code>REQ_PREV_CHOICE</code> let the user request the next or previous value of a field type comprising an ordered set of values. <code>set_fieldtype_choice()</code> allows the application programmer to implement these requests for the given field type. It associates with the given field type those application-defined functions that return pointers to the next or previous choice for the field.</p> <p><code>link_fieldtype()</code> returns a pointer to the field type built from the two given types. The constituent types may be any application-defined or pre-defined types.</p> |                   |                                     |                             |               |                             |                           |                          |                                          |
| <b>RETURN VALUES</b>        | <p>Routines that return pointers always return NULL on error. Routines that return an integer return one of the following:</p> <table><tr><td><code>E_OK</code></td><td>The function returned successfully.</td></tr><tr><td><code>E_SYSTEM_ERROR</code></td><td>System error.</td></tr><tr><td><code>E_BAD_ARGUMENT</code></td><td>An argument is incorrect.</td></tr><tr><td><code>E_CONNECTED</code></td><td>Type is connected to one or more fields.</td></tr></table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <code>E_OK</code> | The function returned successfully. | <code>E_SYSTEM_ERROR</code> | System error. | <code>E_BAD_ARGUMENT</code> | An argument is incorrect. | <code>E_CONNECTED</code> | Type is connected to one or more fields. |
| <code>E_OK</code>           | The function returned successfully.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |                                     |                             |               |                             |                           |                          |                                          |
| <code>E_SYSTEM_ERROR</code> | System error.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                   |                                     |                             |               |                             |                           |                          |                                          |
| <code>E_BAD_ARGUMENT</code> | An argument is incorrect.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                   |                                     |                             |               |                             |                           |                          |                                          |
| <code>E_CONNECTED</code>    | Type is connected to one or more fields.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                   |                                     |                             |               |                             |                           |                          |                                          |

`form_fieldtype(3CURSES)`

**ATTRIBUTES** See `attributes(5)` for descriptions of the following attributes:

| ATTRIBUTE TYPE | ATTRIBUTE VALUE |
|----------------|-----------------|
| MT-Level       | Unsafe          |

**SEE ALSO** `curses(3CURSES)`, `forms(3CURSES)`, `attributes(5)`

**NOTES** The header `<form.h>` automatically includes the headers `<eti.h>` and `<curses.h>`.

## form\_field\_userptr(3CURSES)

**NAME** form\_field\_userptr, set\_field\_userptr, field\_userptr – associate application data with forms

**SYNOPSIS**

```
cc [flag...] file... -lform -lcurses [library...]
#include <form.h>

int set_field_userptr(FIELD *field, char *ptr);
char *field_userptr(FIELD *field);
```

**DESCRIPTION** Every field has an associated user pointer that can be used to store pertinent data. set\_field\_userptr() sets the user pointer of *field*. field\_userptr() returns the user pointer of *field*.

**RETURN VALUES** field\_userptr() returns NULL on error. set\_field\_userptr() returns one of the following:

|                |                                     |
|----------------|-------------------------------------|
| E_OK           | The function returned successfully. |
| E_SYSTEM_ERROR | System error.                       |

**ATTRIBUTES** See attributes(5) for descriptions of the following attributes:

| ATTRIBUTE TYPE | ATTRIBUTE VALUE |
|----------------|-----------------|
| MT-Level       | Unsafe          |

**SEE ALSO** curses(3CURSES), forms(3CURSES), attributes(5)

**NOTES** The header <form.h> automatically includes the headers <eti.h> and <curses.h>.

| <b>NAME</b>          | form_field_validation, set_field_type, field_type, field_arg – forms field data type validation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                |                 |          |        |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-----------------|----------|--------|
| <b>SYNOPSIS</b>      | <pre>cc [ flag... ] file... -lform -lcurses [ library... ] #include &lt;form.h&gt;  int set_field_type(FIELD *field, FIELDTYPE *type, ...); FIELDTYPE *field_type(FIELD *field); char *field_arg(FIELD *field);</pre>                                                                                                                                                                                                                                                                                                                                                                                            |                |                 |          |        |
| <b>DESCRIPTION</b>   | <p>set_field_type() associates the specified field type with <i>field</i>. Certain field types take additional arguments. TYPE_ALNUM, for instance, requires one, the minimum width specification for the field. The other predefined field types are: TYPE_ALPHA, TYPE_ENUM, TYPE_INTEGER, TYPE_NUMERIC, and TYPE_REGEX.</p> <p>field_type() returns a pointer to the field type of <i>field</i>. NULL is returned if no field type is assigned.</p> <p>field_arg() returns a pointer to the field arguments associated with the field type of <i>field</i>. NULL is returned if no field type is assigned.</p> |                |                 |          |        |
| <b>RETURN VALUES</b> | <p>field_type() and field_arg() return NULL on error.</p> <p>set_field_type() returns one of the following:</p> <p>E_OK                                   The function returned successfully.</p> <p>E_SYSTEM_ERROR                        System error.</p>                                                                                                                                                                                                                                                                                                                                                     |                |                 |          |        |
| <b>ATTRIBUTES</b>    | See attributes(5) for descriptions of the following attributes:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                |                 |          |        |
|                      | <table border="1"> <thead> <tr> <th>ATTRIBUTE TYPE</th> <th>ATTRIBUTE VALUE</th> </tr> </thead> <tbody> <tr> <td>MT-Level</td> <td>Unsafe</td> </tr> </tbody> </table>                                                                                                                                                                                                                                                                                                                                                                                                                                           | ATTRIBUTE TYPE | ATTRIBUTE VALUE | MT-Level | Unsafe |
| ATTRIBUTE TYPE       | ATTRIBUTE VALUE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                |                 |          |        |
| MT-Level             | Unsafe                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                |                 |          |        |
| <b>SEE ALSO</b>      | curses(3CURSES), forms(3CURSES), attributes(5)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                |                 |          |        |
| <b>NOTES</b>         | The header <form.h> automatically includes the headers <eti.h> and <curses.h>.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                |                 |          |        |

## form\_hook(3CURSES)

|                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |      |                                     |                |               |
|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-------------------------------------|----------------|---------------|
| <b>NAME</b>          | form_hook, set_form_init, form_init, set_form_term, form_term, set_field_init, field_init, set_field_term, field_term – assign application-specific routines for invocation by forms                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |      |                                     |                |               |
| <b>SYNOPSIS</b>      | <pre>cc [ flag... ] file... -lform -lcurses [ library... ] #include &lt;form.h&gt;  int set_form_init(FORM *form, void (*func)(FORM*)); void (*form_init)(FORM *form);  int set_form_term(FORM *form, void (*func)(FORM*)); void (*form_term)(FORM *form);  int set_field_init(FORM *form, void (*func)(FORM*)); void (*field_init)(FORM *form);  int set_field_term(FORM *form, void (*func)(FORM*)); void (*field_term)(FORM *form);</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |      |                                     |                |               |
| <b>DESCRIPTION</b>   | <p>These routines allow the programmer to assign application specific routines to be executed automatically at initialization and termination points in the forms application. The user need not specify any application-defined initialization or termination routines at all, but they may be helpful for displaying messages or page numbers and other chores.</p> <p>set_form_init() assigns an application-defined initialization function to be called when the <i>form</i> is posted and just after a page change. form_init() returns a pointer to the initialization function, if any.</p> <p>set_form_term() assigns an application-defined function to be called when the <i>form</i> is unposted and just before a page change. form_term() returns a pointer to the function, if any.</p> <p>set_field_init() assigns an application-defined function to be called when the <i>form</i> is posted and just after the current field changes. field_init() returns a pointer to the function, if any.</p> <p>set_field_term() assigns an application-defined function to be called when the <i>form</i> is unposted and just before the current field changes. field_term() returns a pointer to the function, if any.</p> |      |                                     |                |               |
| <b>RETURN VALUES</b> | <p>Routines that return pointers always return NULL on error. Routines that return an integer return one of the following:</p> <table><tr><td>E_OK</td><td>The function returned successfully.</td></tr><tr><td>E_SYSTEM_ERROR</td><td>System error.</td></tr></table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | E_OK | The function returned successfully. | E_SYSTEM_ERROR | System error. |
| E_OK                 | The function returned successfully.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |      |                                     |                |               |
| E_SYSTEM_ERROR       | System error.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |      |                                     |                |               |

form\_hook(3CURSES)

**ATTRIBUTES** See attributes(5) for descriptions of the following attributes:

| ATTRIBUTE TYPE | ATTRIBUTE VALUE |
|----------------|-----------------|
| MT-Level       | Unsafe          |

**SEE ALSO** curses(3CURSES), forms(3CURSES), attributes(5)

**NOTES** The header <form.h> automatically includes the headers <eti.h> and <curses.h>.



**NAME** form\_new\_page, set\_new\_page, new\_page – forms pagination

**SYNOPSIS**

```
cc [flag...] file... -lform -lcurses [library...]
#include <form.h>

int set_new_page(FIELD *field, int bool);
int new_page(FIELD *field);
```

**DESCRIPTION** set\_new\_page() marks *field* as the beginning of a new page on the form.

new\_page() returns a boolean value indicating whether or not *field* begins a new page of the form.

**RETURN VALUES** new\_page returns TRUE or FALSE.

set\_new\_page() returns one of the following:

|                |                                           |
|----------------|-------------------------------------------|
| E_OK           | The function returned successfully.       |
| E_CONNECTED    | The field is already connected to a form. |
| E_SYSTEM_ERROR | System error.                             |

**ATTRIBUTES** See attributes(5) for descriptions of the following attributes:

| ATTRIBUTE TYPE | ATTRIBUTE VALUE |
|----------------|-----------------|
| MT-Level       | Unsafe          |

**SEE ALSO** curses(3CURSES), forms(3CURSES), attributes(5)

**NOTES** The header <form.h> automatically includes the headers <eti.h> and <curses.h>.

## form\_opts(3CURSES)

| <b>NAME</b>          | form_opts, set_form_opts, form_opts_on, form_opts_off – forms option routines                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                |                 |          |        |
|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-----------------|----------|--------|
| <b>SYNOPSIS</b>      | <pre>cc [ flag... ] file... -lform -lcurses [ library... ] #include &lt;form.h&gt;  int set_form_opts(FORM *form, OPTIONS opts); int form_opts_on(FORM *form, OPTIONS opts); int form_opts_off(FORM *form, OPTIONS opts); OPTIONS form_opts(FORM *form);</pre>                                                                                                                                                                                                                                                                               |                |                 |          |        |
| <b>DESCRIPTION</b>   | <p>set_form_opts() turns on the named options for <i>form</i> and turns off all remaining options. Options are boolean values which can be OR-ed together. form_opts_on() turns on the named options; no other options are changed. form_opts_off() turns off the named options; no other options are changed.</p> <p>form_opts() returns the options set for <i>form</i>.</p> <p>O_NL_OVERLOAD            Overload the REQ_NEW_LINE form driver request.</p> <p>O_BS_OVERLOAD            Overload the REQ_DEL_PREV form driver request.</p> |                |                 |          |        |
| <b>RETURN VALUES</b> | <p>set_form_opts(), form_opts_on(), and form_opts_off() return one of the following:</p> <p>E_OK                      The function returned successfully.</p> <p>E_SYSTEM_ERROR            System error.</p>                                                                                                                                                                                                                                                                                                                                 |                |                 |          |        |
| <b>ATTRIBUTES</b>    | See attributes (5) for descriptions of the following attributes:                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                |                 |          |        |
|                      | <table border="1"><thead><tr><th>ATTRIBUTE TYPE</th><th>ATTRIBUTE VALUE</th></tr></thead><tbody><tr><td>MT-Level</td><td>Unsafe</td></tr></tbody></table>                                                                                                                                                                                                                                                                                                                                                                                    | ATTRIBUTE TYPE | ATTRIBUTE VALUE | MT-Level | Unsafe |
| ATTRIBUTE TYPE       | ATTRIBUTE VALUE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                |                 |          |        |
| MT-Level             | Unsafe                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |                 |          |        |
| <b>SEE ALSO</b>      | curses(3CURSES), forms(3CURSES), attributes(5)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                |                 |          |        |
| <b>NOTES</b>         | The header <form.h> automatically includes the headers <eti.h> and <curses.h>.                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                |                 |          |        |

| <b>NAME</b>          | form_page, set_form_page, set_current_field, current_field, field_index – set forms current page and field                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                |                                     |                |               |                |                           |             |                                                                        |                 |                                 |                  |                                |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------------------------------------|----------------|---------------|----------------|---------------------------|-------------|------------------------------------------------------------------------|-----------------|---------------------------------|------------------|--------------------------------|
| <b>SYNOPSIS</b>      | <pre>cc [ flag... ] file... -lform -lcurses [ library... ] #include &lt;form.h&gt;  int set_form_page(FORM *form, int page); int form_page(FORM *form); int set_current_field(FORM *form, FIELD *field); FIELD *current_field(FORM*form); int field_index(FIELD *field);</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                          |                |                                     |                |               |                |                           |             |                                                                        |                 |                                 |                  |                                |
| <b>DESCRIPTION</b>   | <p>set_form_page() sets the page number of <i>form</i> to <i>page</i>. form_page() returns the current page number of <i>form</i>.</p> <p>set_current_field() sets the current field of <i>form</i> to <i>field</i>. current_field() returns a pointer to the current field of <i>form</i>.</p> <p>field_index() returns the index in the field pointer array of <i>field</i>.</p>                                                                                                                                                                                                                                                                                                                                      |                |                                     |                |               |                |                           |             |                                                                        |                 |                                 |                  |                                |
| <b>RETURN VALUES</b> | <p>form_page() returns -1 on error.</p> <p>current_field() returns NULL on error.</p> <p>field_index() returns -1 on error.</p> <p>set_form_page() and set_current_field() return one of the following:</p> <table border="0"> <tr> <td>E_OK</td> <td>The function returned successfully.</td> </tr> <tr> <td>E_SYSTEM_ERROR</td> <td>System error.</td> </tr> <tr> <td>E_BAD_ARGUMENT</td> <td>An argument is incorrect.</td> </tr> <tr> <td>E_BAD_STATE</td> <td>The routine was called from an initialization or termination function.</td> </tr> <tr> <td>E_INVALID_FIELD</td> <td>The field contents are invalid.</td> </tr> <tr> <td>E_REQUEST_DENIED</td> <td>The form driver request failed</td> </tr> </table> | E_OK           | The function returned successfully. | E_SYSTEM_ERROR | System error. | E_BAD_ARGUMENT | An argument is incorrect. | E_BAD_STATE | The routine was called from an initialization or termination function. | E_INVALID_FIELD | The field contents are invalid. | E_REQUEST_DENIED | The form driver request failed |
| E_OK                 | The function returned successfully.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                |                                     |                |               |                |                           |             |                                                                        |                 |                                 |                  |                                |
| E_SYSTEM_ERROR       | System error.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                |                                     |                |               |                |                           |             |                                                                        |                 |                                 |                  |                                |
| E_BAD_ARGUMENT       | An argument is incorrect.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                |                                     |                |               |                |                           |             |                                                                        |                 |                                 |                  |                                |
| E_BAD_STATE          | The routine was called from an initialization or termination function.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                |                                     |                |               |                |                           |             |                                                                        |                 |                                 |                  |                                |
| E_INVALID_FIELD      | The field contents are invalid.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                |                                     |                |               |                |                           |             |                                                                        |                 |                                 |                  |                                |
| E_REQUEST_DENIED     | The form driver request failed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                |                                     |                |               |                |                           |             |                                                                        |                 |                                 |                  |                                |
| <b>ATTRIBUTES</b>    | See attributes(5) for descriptions of the following attributes:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                |                                     |                |               |                |                           |             |                                                                        |                 |                                 |                  |                                |
|                      | <table border="1"> <thead> <tr> <th>ATTRIBUTE TYPE</th> <th>ATTRIBUTE VALUE</th> </tr> </thead> <tbody> <tr> <td>MT-Level</td> <td>Unsafe</td> </tr> </tbody> </table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | ATTRIBUTE TYPE | ATTRIBUTE VALUE                     | MT-Level       | Unsafe        |                |                           |             |                                                                        |                 |                                 |                  |                                |
| ATTRIBUTE TYPE       | ATTRIBUTE VALUE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                |                                     |                |               |                |                           |             |                                                                        |                 |                                 |                  |                                |
| MT-Level             | Unsafe                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                |                                     |                |               |                |                           |             |                                                                        |                 |                                 |                  |                                |
| <b>SEE ALSO</b>      | curses(3CURSES), forms(3CURSES), attributes(5)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                |                                     |                |               |                |                           |             |                                                                        |                 |                                 |                  |                                |

form\_page(3CURSES)

**NOTES** | The header `<form.h>` automatically includes the headers `<eti.h>` and `<curses.h>`.

| <b>NAME</b>          | form_post, post_form, unpost_form – write or erase forms from associated subwindows                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                |                                     |                |               |                |                           |          |                     |              |                         |           |                                         |             |                                                                        |                 |                                       |
|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------------------------------------|----------------|---------------|----------------|---------------------------|----------|---------------------|--------------|-------------------------|-----------|-----------------------------------------|-------------|------------------------------------------------------------------------|-----------------|---------------------------------------|
| <b>SYNOPSIS</b>      | <pre>cc [ flag... ] file... -lform -lcurses [ library... ] #include &lt;form.h&gt;  int post_form(FORM *form) ; int unpost_form(FORM *form) ;</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                |                                     |                |               |                |                           |          |                     |              |                         |           |                                         |             |                                                                        |                 |                                       |
| <b>DESCRIPTION</b>   | <p>post_form() writes <i>form</i> into its associated subwindow. The application programmer must use curses library routines to display the form on the physical screen or call update_panels() if the panels library is being used.</p> <p>unpost_form() erases <i>form</i> from its associated subwindow.</p>                                                                                                                                                                                                                                                                                                                                                                                    |                |                                     |                |               |                |                           |          |                     |              |                         |           |                                         |             |                                                                        |                 |                                       |
| <b>RETURN VALUES</b> | <p>These routines return one of the following:</p> <table border="0"> <tr> <td>E_OK</td> <td>The function returned successfully.</td> </tr> <tr> <td>E_SYSTEM_ERROR</td> <td>System error.</td> </tr> <tr> <td>E_BAD_ARGUMENT</td> <td>An argument is incorrect.</td> </tr> <tr> <td>E_POSTED</td> <td>The form is posted.</td> </tr> <tr> <td>E_NOT_POSTED</td> <td>The form is not posted.</td> </tr> <tr> <td>E_NO_ROOM</td> <td>The form does not fit in the subwindow.</td> </tr> <tr> <td>E_BAD_STATE</td> <td>The routine was called from an initialization or termination function.</td> </tr> <tr> <td>E_NOT_CONNECTED</td> <td>The field is not connected to a form.</td> </tr> </table> | E_OK           | The function returned successfully. | E_SYSTEM_ERROR | System error. | E_BAD_ARGUMENT | An argument is incorrect. | E_POSTED | The form is posted. | E_NOT_POSTED | The form is not posted. | E_NO_ROOM | The form does not fit in the subwindow. | E_BAD_STATE | The routine was called from an initialization or termination function. | E_NOT_CONNECTED | The field is not connected to a form. |
| E_OK                 | The function returned successfully.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                |                                     |                |               |                |                           |          |                     |              |                         |           |                                         |             |                                                                        |                 |                                       |
| E_SYSTEM_ERROR       | System error.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                |                                     |                |               |                |                           |          |                     |              |                         |           |                                         |             |                                                                        |                 |                                       |
| E_BAD_ARGUMENT       | An argument is incorrect.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                |                                     |                |               |                |                           |          |                     |              |                         |           |                                         |             |                                                                        |                 |                                       |
| E_POSTED             | The form is posted.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                |                                     |                |               |                |                           |          |                     |              |                         |           |                                         |             |                                                                        |                 |                                       |
| E_NOT_POSTED         | The form is not posted.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                |                                     |                |               |                |                           |          |                     |              |                         |           |                                         |             |                                                                        |                 |                                       |
| E_NO_ROOM            | The form does not fit in the subwindow.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                |                                     |                |               |                |                           |          |                     |              |                         |           |                                         |             |                                                                        |                 |                                       |
| E_BAD_STATE          | The routine was called from an initialization or termination function.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                |                                     |                |               |                |                           |          |                     |              |                         |           |                                         |             |                                                                        |                 |                                       |
| E_NOT_CONNECTED      | The field is not connected to a form.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                |                                     |                |               |                |                           |          |                     |              |                         |           |                                         |             |                                                                        |                 |                                       |
| <b>ATTRIBUTES</b>    | <p>See attributes(5) for descriptions of the following attributes:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">ATTRIBUTE TYPE</th> <th style="text-align: center;">ATTRIBUTE VALUE</th> </tr> </thead> <tbody> <tr> <td>MT-Level</td> <td>Unsafe</td> </tr> </tbody> </table>                                                                                                                                                                                                                                                                                                                                              | ATTRIBUTE TYPE | ATTRIBUTE VALUE                     | MT-Level       | Unsafe        |                |                           |          |                     |              |                         |           |                                         |             |                                                                        |                 |                                       |
| ATTRIBUTE TYPE       | ATTRIBUTE VALUE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                |                                     |                |               |                |                           |          |                     |              |                         |           |                                         |             |                                                                        |                 |                                       |
| MT-Level             | Unsafe                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                |                                     |                |               |                |                           |          |                     |              |                         |           |                                         |             |                                                                        |                 |                                       |
| <b>SEE ALSO</b>      | curses(3CURSES), forms(3CURSES), panel_update(3CURSES), panels(3CURSES), attributes(5)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                |                                     |                |               |                |                           |          |                     |              |                         |           |                                         |             |                                                                        |                 |                                       |
| <b>NOTES</b>         | The header <form.h> automatically includes the headers <eti.h> and <curses.h>.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                |                                     |                |               |                |                           |          |                     |              |                         |           |                                         |             |                                                                        |                 |                                       |

forms(3CURSES)

| <b>NAME</b>                                        | forms – character based forms package                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                    |                  |                            |                            |                         |                            |                          |                            |                        |                                 |                                 |                                  |                        |                                        |                         |                                        |                           |                                    |                          |                             |                         |                                        |                          |                            |                         |                                  |                         |                            |
|----------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|------------------|----------------------------|----------------------------|-------------------------|----------------------------|--------------------------|----------------------------|------------------------|---------------------------------|---------------------------------|----------------------------------|------------------------|----------------------------------------|-------------------------|----------------------------------------|---------------------------|------------------------------------|--------------------------|-----------------------------|-------------------------|----------------------------------------|--------------------------|----------------------------|-------------------------|----------------------------------|-------------------------|----------------------------|
| <b>SYNOPSIS</b>                                    | <code>#include &lt;form.h&gt;</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                    |                  |                            |                            |                         |                            |                          |                            |                        |                                 |                                 |                                  |                        |                                        |                         |                                        |                           |                                    |                          |                             |                         |                                        |                          |                            |                         |                                  |                         |                            |
| <b>DESCRIPTION</b>                                 | <p>The <code>form</code> library is built using the <code>curses</code> library, and any program using <code>forms</code> routines must call one of the <code>curses</code> initialization routines such as <code>initscr</code>. A program using these routines must be compiled with <code>-lform</code> and <code>-lcurses</code> on the <code>cc</code> command line.</p> <p>The <code>forms</code> package gives the applications programmer a terminal-independent method of creating and customizing forms for user-interaction. The <code>forms</code> package includes: field routines, which are used to create and customize fields, link fields and assign field types; fieldtype routines, which are used to create new field types for validating fields; and form routines, which are used to create and customize forms, assign pre/post processing functions, and display and interact with forms.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                    |                  |                            |                            |                         |                            |                          |                            |                        |                                 |                                 |                                  |                        |                                        |                         |                                        |                           |                                    |                          |                             |                         |                                        |                          |                            |                         |                                  |                         |                            |
| <b>Current Default Values for Field Attributes</b> | <p>The <code>forms</code> package establishes initial current default values for field attributes. During field initialization, each field attribute is assigned the current default value for that attribute. An application can change or retrieve a current default attribute value by calling the appropriate set or retrieve routine with a <code>NULL</code> field pointer. If an application changes a current default field attribute value, subsequent fields created using <code>new_field()</code> will have the new default attribute value. (The attributes of previously created fields are not changed if a current default attribute value is changed.)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                    |                  |                            |                            |                         |                            |                          |                            |                        |                                 |                                 |                                  |                        |                                        |                         |                                        |                           |                                    |                          |                             |                         |                                        |                          |                            |                         |                                  |                         |                            |
| <b>Routine Name Index</b>                          | <p>The following table lists each <code>forms</code> routine and the name of the manual page on which it is described.</p> <table border="0"> <thead> <tr> <th style="text-align: left;">forms Routine Name</th> <th style="text-align: left;">Manual Page Name</th> </tr> </thead> <tbody> <tr><td><code>current_field</code></td><td><code>form_page(3X)</code></td></tr> <tr><td><code>data_ahead</code></td><td><code>form_data(3X)</code></td></tr> <tr><td><code>data_behind</code></td><td><code>form_data(3X)</code></td></tr> <tr><td><code>dup_field</code></td><td><code>form_field_new(3X)</code></td></tr> <tr><td><code>dynamic_field_info</code></td><td><code>form_field_info(3X)</code></td></tr> <tr><td><code>field_arg</code></td><td><code>form_field_validation(3X)</code></td></tr> <tr><td><code>field_back</code></td><td><code>form_field_attributes(3X)</code></td></tr> <tr><td><code>field_buffer</code></td><td><code>form_field_buffer(3X)</code></td></tr> <tr><td><code>field_count</code></td><td><code>form_field(3X)</code></td></tr> <tr><td><code>field_fore</code></td><td><code>form_field_attributes(3X)</code></td></tr> <tr><td><code>field_index</code></td><td><code>form_page(3X)</code></td></tr> <tr><td><code>field_info</code></td><td><code>form_field_info(3X)</code></td></tr> <tr><td><code>field_init</code></td><td><code>form_hook(3X)</code></td></tr> </tbody> </table> | forms Routine Name | Manual Page Name | <code>current_field</code> | <code>form_page(3X)</code> | <code>data_ahead</code> | <code>form_data(3X)</code> | <code>data_behind</code> | <code>form_data(3X)</code> | <code>dup_field</code> | <code>form_field_new(3X)</code> | <code>dynamic_field_info</code> | <code>form_field_info(3X)</code> | <code>field_arg</code> | <code>form_field_validation(3X)</code> | <code>field_back</code> | <code>form_field_attributes(3X)</code> | <code>field_buffer</code> | <code>form_field_buffer(3X)</code> | <code>field_count</code> | <code>form_field(3X)</code> | <code>field_fore</code> | <code>form_field_attributes(3X)</code> | <code>field_index</code> | <code>form_page(3X)</code> | <code>field_info</code> | <code>form_field_info(3X)</code> | <code>field_init</code> | <code>form_hook(3X)</code> |
| forms Routine Name                                 | Manual Page Name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                    |                  |                            |                            |                         |                            |                          |                            |                        |                                 |                                 |                                  |                        |                                        |                         |                                        |                           |                                    |                          |                             |                         |                                        |                          |                            |                         |                                  |                         |                            |
| <code>current_field</code>                         | <code>form_page(3X)</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                    |                  |                            |                            |                         |                            |                          |                            |                        |                                 |                                 |                                  |                        |                                        |                         |                                        |                           |                                    |                          |                             |                         |                                        |                          |                            |                         |                                  |                         |                            |
| <code>data_ahead</code>                            | <code>form_data(3X)</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                    |                  |                            |                            |                         |                            |                          |                            |                        |                                 |                                 |                                  |                        |                                        |                         |                                        |                           |                                    |                          |                             |                         |                                        |                          |                            |                         |                                  |                         |                            |
| <code>data_behind</code>                           | <code>form_data(3X)</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                    |                  |                            |                            |                         |                            |                          |                            |                        |                                 |                                 |                                  |                        |                                        |                         |                                        |                           |                                    |                          |                             |                         |                                        |                          |                            |                         |                                  |                         |                            |
| <code>dup_field</code>                             | <code>form_field_new(3X)</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                    |                  |                            |                            |                         |                            |                          |                            |                        |                                 |                                 |                                  |                        |                                        |                         |                                        |                           |                                    |                          |                             |                         |                                        |                          |                            |                         |                                  |                         |                            |
| <code>dynamic_field_info</code>                    | <code>form_field_info(3X)</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                    |                  |                            |                            |                         |                            |                          |                            |                        |                                 |                                 |                                  |                        |                                        |                         |                                        |                           |                                    |                          |                             |                         |                                        |                          |                            |                         |                                  |                         |                            |
| <code>field_arg</code>                             | <code>form_field_validation(3X)</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                    |                  |                            |                            |                         |                            |                          |                            |                        |                                 |                                 |                                  |                        |                                        |                         |                                        |                           |                                    |                          |                             |                         |                                        |                          |                            |                         |                                  |                         |                            |
| <code>field_back</code>                            | <code>form_field_attributes(3X)</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                    |                  |                            |                            |                         |                            |                          |                            |                        |                                 |                                 |                                  |                        |                                        |                         |                                        |                           |                                    |                          |                             |                         |                                        |                          |                            |                         |                                  |                         |                            |
| <code>field_buffer</code>                          | <code>form_field_buffer(3X)</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |                  |                            |                            |                         |                            |                          |                            |                        |                                 |                                 |                                  |                        |                                        |                         |                                        |                           |                                    |                          |                             |                         |                                        |                          |                            |                         |                                  |                         |                            |
| <code>field_count</code>                           | <code>form_field(3X)</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                    |                  |                            |                            |                         |                            |                          |                            |                        |                                 |                                 |                                  |                        |                                        |                         |                                        |                           |                                    |                          |                             |                         |                                        |                          |                            |                         |                                  |                         |                            |
| <code>field_fore</code>                            | <code>form_field_attributes(3X)</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                    |                  |                            |                            |                         |                            |                          |                            |                        |                                 |                                 |                                  |                        |                                        |                         |                                        |                           |                                    |                          |                             |                         |                                        |                          |                            |                         |                                  |                         |                            |
| <code>field_index</code>                           | <code>form_page(3X)</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                    |                  |                            |                            |                         |                            |                          |                            |                        |                                 |                                 |                                  |                        |                                        |                         |                                        |                           |                                    |                          |                             |                         |                                        |                          |                            |                         |                                  |                         |                            |
| <code>field_info</code>                            | <code>form_field_info(3X)</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                    |                  |                            |                            |                         |                            |                          |                            |                        |                                 |                                 |                                  |                        |                                        |                         |                                        |                           |                                    |                          |                             |                         |                                        |                          |                            |                         |                                  |                         |                            |
| <code>field_init</code>                            | <code>form_hook(3X)</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                    |                  |                            |                            |                         |                            |                          |                            |                        |                                 |                                 |                                  |                        |                                        |                         |                                        |                           |                                    |                          |                             |                         |                                        |                          |                            |                         |                                  |                         |                            |

|                 |                           |
|-----------------|---------------------------|
| field_just      | form_field_just(3X)       |
| field_opts      | form_field_opts(3X)       |
| field_opts_off  | form_field_opts(3X)       |
| field_opts_on   | form_field_opts(3X)       |
| field_pad       | form_field_attributes(3X) |
| field_status    | form_field_buffer(3X)     |
| field_term      | form_hook(3X)             |
| field_type      | form_field_validation(3X) |
| field_userptr   | form_field_userptr(3X)    |
| form_driver     | form_driver(3X)           |
| form_fields     | form_field(3X)            |
| form_init       | form_hook(3X)             |
| form_opts       | form_opts(3X)             |
| form_opts_off   | form_opts(3X)             |
| form_opts_on    | form_opts(3X)             |
| form_page       | form_page(3X)             |
| form_sub        | form_win(3X)              |
| form_term       | form_hook(3X)             |
| form_userptr    | form_userptr(3X)          |
| form_win        | form_win(3X)              |
| free_field      | form_field_new(3X)        |
| free_fieldtype  | form_fieldtype(3X)        |
| free_form       | form_new(3X)              |
| link_field      | form_field_new(3X)        |
| link_fieldtype  | form_fieldtype(3X)        |
| move_field      | form_field(3X)            |
| new_field       | form_field_new(3X)        |
| new_fieldtype   | form_fieldtype(3X)        |
| new_form        | form_new(3X)              |
| new_page        | form_new_page(3X)         |
| pos_form_cursor | form_cursor(3X)           |

## forms(3CURSES)

|                      |                           |
|----------------------|---------------------------|
| post_form            | form_post(3X)             |
| scale_form           | form_win(3X)              |
| set_current_field    | form_page(3X)             |
| set_field_back       | form_field_attributes(3X) |
| set_field_buffer     | form_field_buffer(3X)     |
| set_field_fore       | form_field_attributes(3X) |
| set_field_init       | form_hook(3X)             |
| set_field_just       | form_field_just(3X)       |
| set_field_opts       | form_field_opts(3X)       |
| set_field_pad        | form_field_attributes(3X) |
| set_field_status     | form_field_buffer(3X)     |
| set_field_term       | form_hook(3X)             |
| set_field_type       | form_field_validation(3X) |
| set_field_userptr    | form_field_userptr(3X)    |
| set_fieldtype_arg    | form_fieldtype(3X)        |
| set_fieldtype_choice | form_fieldtype(3X)        |
| set_form_fields      | form_field(3X)            |
| set_form_init        | form_hook(3X)             |
| set_form_opts        | form_opts(3X)             |
| set_form_page        | form_page(3X)             |
| set_form_sub         | form_win(3X)              |
| set_form_term        | form_hook(3X)             |
| set_form_userptr     | form_userptr(3X)          |
| set_form_win         | form_win(3X)              |
| set_max_field        | form_field_buffer(3X)     |
| set_new_page         | form_new_page(3X)         |
| unpost_form          | form_post(3X)             |

### RETURN VALUES

Routines that return a pointer always return `NULL` on error. Routines that return an integer return one of the following:

|                          |                                           |
|--------------------------|-------------------------------------------|
| <code>E_OK</code>        | The function returned successfully.       |
| <code>E_CONNECTED</code> | The field is already connected to a form. |

|                   |                                                                        |
|-------------------|------------------------------------------------------------------------|
| E_SYSTEM_ERROR    | System error.                                                          |
| E_BAD_ARGUMENT    | An argument is incorrect.                                              |
| E_CURRENT         | The field is the current field.                                        |
| E_POSTED          | The form is posted.                                                    |
| E_NOT_POSTED      | The form is not posted.                                                |
| E_INVALID_FIELD   | The field contents are invalid.                                        |
| E_NOT_CONNECTED   | The field is not connected to a form.                                  |
| E_NO_ROOM         | The form does not fit in the subwindow.                                |
| E_BAD_STATE       | The routine was called from an initialization or termination function. |
| E_REQUEST_DENIED  | The form driver request failed.                                        |
| E_UNKNOWN_COMMAND | An unknown request was passed to the form driver.                      |

**ATTRIBUTES** See `attributes(5)` for descriptions of the following attributes:

| ATTRIBUTE TYPE | ATTRIBUTE VALUE |
|----------------|-----------------|
| MT-Level       | Unsafe          |

**SEE ALSO** `curses(3CURSES)`, `attributes(5)`

**NOTES** The header `<form.h>` automatically includes the headers `<eti.h>` and `<curses.h>`.

## form\_userptr(3CURSES)

**NAME** | form\_userptr, set\_form\_userptr – associate application data with forms

**SYNOPSIS** | 

```
cc [flag...] file... -lform -lcurses [library...]
#include <form.h>

int set_form_userptr(FORM *form, char *ptr);
char *form_userptr(FORM *form);
```

**DESCRIPTION** | Every form has an associated user pointer that can be used to store pertinent data. set\_form\_userptr() sets the user pointer of *form*. form\_userptr() returns the user pointer of *form*.

**RETURN VALUES** | form\_userptr() returns NULL on error. set\_form\_userptr() returns one of the following:

E\_OK | The function returned successfully.

E\_SYSTEM\_ERROR | System error.

**ATTRIBUTES** | See attributes(5) for descriptions of the following attributes:

| ATTRIBUTE TYPE | ATTRIBUTE VALUE |
|----------------|-----------------|
| MT-Level       | Unsafe          |

**SEE ALSO** | curses(3CURSES), forms(3CURSES), attributes(5)

**NOTES** | The header <form.h> automatically includes the headers <eti.h> and <curses.h>.

| <b>NAME</b>          | form_win, set_form_win, set_form_sub, form_sub, scale_form – forms window and subwindow association routines                                                                                                                                                                                                                                                                                                                                                                                                  |                |                                     |                |               |                |                           |                 |                                       |          |                     |
|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------------------------------------|----------------|---------------|----------------|---------------------------|-----------------|---------------------------------------|----------|---------------------|
| <b>SYNOPSIS</b>      | <pre>cc [ flag... ] file... -lform -lcurses [ library... ] #include &lt;form.h&gt;  int set_form_win(FORM *form, WINDOW *win); WINDOW *form_win(FORM *form); int set_form_sub(FORM *form, WINDOW *sub); WINDOW *form_sub(FORM *form); int scale_form(FORM *form, int *rows, int *cols);</pre>                                                                                                                                                                                                                 |                |                                     |                |               |                |                           |                 |                                       |          |                     |
| <b>DESCRIPTION</b>   | <p>set_form_win() sets the window of <i>form</i> to <i>win</i>. form_win() returns a pointer to the window associated with <i>form</i>. set_form_sub() sets the subwindow of <i>form</i> to <i>sub</i>. form_sub() returns a pointer to the subwindow associated with <i>form</i>. scale_form() returns the smallest window size necessary for the subwindow of <i>form</i>. <i>rows</i> and <i>cols</i> are pointers to the locations used to return the number of rows and columns for the form.</p>        |                |                                     |                |               |                |                           |                 |                                       |          |                     |
| <b>RETURN VALUES</b> | <p>Routines that return pointers always return NULL on error. Routines that return an integer return one of the following:</p> <table border="0"> <tr> <td>E_OK</td> <td>The function returned successfully.</td> </tr> <tr> <td>E_SYSTEM_ERROR</td> <td>System error.</td> </tr> <tr> <td>E_BAD_ARGUMENT</td> <td>An argument is incorrect.</td> </tr> <tr> <td>E_NOT_CONNECTED</td> <td>The field is not connected to a form.</td> </tr> <tr> <td>E_POSTED</td> <td>The form is posted.</td> </tr> </table> | E_OK           | The function returned successfully. | E_SYSTEM_ERROR | System error. | E_BAD_ARGUMENT | An argument is incorrect. | E_NOT_CONNECTED | The field is not connected to a form. | E_POSTED | The form is posted. |
| E_OK                 | The function returned successfully.                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                |                                     |                |               |                |                           |                 |                                       |          |                     |
| E_SYSTEM_ERROR       | System error.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                |                                     |                |               |                |                           |                 |                                       |          |                     |
| E_BAD_ARGUMENT       | An argument is incorrect.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                |                                     |                |               |                |                           |                 |                                       |          |                     |
| E_NOT_CONNECTED      | The field is not connected to a form.                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                |                                     |                |               |                |                           |                 |                                       |          |                     |
| E_POSTED             | The form is posted.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                |                                     |                |               |                |                           |                 |                                       |          |                     |
| <b>ATTRIBUTES</b>    | <p>See attributes(5) for descriptions of the following attributes:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">ATTRIBUTE TYPE</th> <th style="text-align: center;">ATTRIBUTE VALUE</th> </tr> </thead> <tbody> <tr> <td>MT-Level</td> <td>Unsafe</td> </tr> </tbody> </table>                                                                                                                                                         | ATTRIBUTE TYPE | ATTRIBUTE VALUE                     | MT-Level       | Unsafe        |                |                           |                 |                                       |          |                     |
| ATTRIBUTE TYPE       | ATTRIBUTE VALUE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                |                                     |                |               |                |                           |                 |                                       |          |                     |
| MT-Level             | Unsafe                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                |                                     |                |               |                |                           |                 |                                       |          |                     |
| <b>SEE ALSO</b>      | curses(3CURSES), forms(3CURSES), attributes(5)                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                |                                     |                |               |                |                           |                 |                                       |          |                     |
| <b>NOTES</b>         | The header <form.h> automatically includes the headers <eti.h> and <curses.h>.                                                                                                                                                                                                                                                                                                                                                                                                                                |                |                                     |                |               |                |                           |                 |                                       |          |                     |

## getbegyx(3XCURSES)

| <b>NAME</b>          | getbegyx, getmaxyx, getparyx, getyx – get cursor or window coordinates                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                |                 |                     |          |          |        |
|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-----------------|---------------------|----------|----------|--------|
| <b>SYNOPSIS</b>      | <pre>cc [ flag... ] file... -I /usr/xpg4/include -L /usr/xpg4/lib \ -R /usr/xpg4/lib -lcurses [ library... ]  c89 [ flag... ] file... -lcurses [ library... ]  #include &lt;curses.h&gt;  void <b>getbegyx</b>(WINDOW *win, int y, int x); void <b>getmaxyx</b>(WINDOW *win, int y, int x); void <b>getparyx</b>(WINDOW *win, int y, int x); void <b>getyx</b>(WINDOW *win, int y, int x);</pre>                                                                                                                                                                                                                                                                                                                                                                   |                |                 |                     |          |          |        |
| <b>DESCRIPTION</b>   | <p>The <code>getyx()</code> macro stores the current cursor position of the specified window in <code>x</code> and <code>y</code>.</p> <p>The <code>getparyx()</code> macro stores the <code>x</code> and <code>y</code> coordinates (relative to the parent window) of the specified window's origin (upper-left corner). If <code>win</code> does not point to a subwindow, <code>x</code> and <code>y</code> are set to <code>-1</code>.</p> <p>The <code>getbegyx()</code> macro stores the <code>x</code> and <code>y</code> coordinates of the specified window's origin (upper-left corner).</p> <p>The <code>getmaxyx()</code> macro stores the numbers of rows in the specified window in <code>y</code> and the number of columns in <code>x</code>.</p> |                |                 |                     |          |          |        |
| <b>PARAMETERS</b>    | <p><code>win</code> Is a pointer to a window.</p> <p><code>y</code> stores the <code>y</code> coordinate for the cursor or origin. The <code>getmaxyx()</code> macro uses it to store the number of rows in the window.</p> <p><code>x</code> stores the <code>x</code> coordinate for the cursor or origin. The <code>getmaxyx()</code> macro uses it to store the number of columns in the window.</p>                                                                                                                                                                                                                                                                                                                                                           |                |                 |                     |          |          |        |
| <b>RETURN VALUES</b> | These macros do not return a value.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                |                 |                     |          |          |        |
| <b>ERRORS</b>        | None.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                |                 |                     |          |          |        |
| <b>ATTRIBUTES</b>    | See <code>attributes(5)</code> for descriptions of the following attributes:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |                 |                     |          |          |        |
|                      | <table border="1"><thead><tr><th>ATTRIBUTE TYPE</th><th>ATTRIBUTE VALUE</th></tr></thead><tbody><tr><td>Interface Stability</td><td>Standard</td></tr><tr><td>MT-Level</td><td>Unsafe</td></tr></tbody></table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | ATTRIBUTE TYPE | ATTRIBUTE VALUE | Interface Stability | Standard | MT-Level | Unsafe |
| ATTRIBUTE TYPE       | ATTRIBUTE VALUE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                |                 |                     |          |          |        |
| Interface Stability  | Standard                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                |                 |                     |          |          |        |
| MT-Level             | Unsafe                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                |                 |                     |          |          |        |
| <b>SEE ALSO</b>      | <code>libcurses(3XCURSES)</code> , <code>attributes(5)</code> , <code>standards(5)</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                |                 |                     |          |          |        |

| <b>NAME</b>          | getcchar – get a wide character string (with rendition) from a <code>cchar_t</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                |                                                |                     |                                                                        |              |                                                           |                   |                                                             |            |                                                                     |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|------------------------------------------------|---------------------|------------------------------------------------------------------------|--------------|-----------------------------------------------------------|-------------------|-------------------------------------------------------------|------------|---------------------------------------------------------------------|
| <b>SYNOPSIS</b>      | <pre>cc [ flag... ] file... -I /usr/xpg4/include -L /usr/xpg4/lib \ -R /usr/xpg4/lib -lcurses [ library... ]  c89 [ flag... ] file... -lcurses [ library... ]  #include &lt;curses.h&gt;  int <b>getcchar</b>(const cchar_t *wcv, wchar_t *wch, attr_t *attrs, short     *color_pair, void *opt);</pre>                                                                                                                                                                                                                                                                                                                                                                                        |                |                                                |                     |                                                                        |              |                                                           |                   |                                                             |            |                                                                     |
| <b>DESCRIPTION</b>   | <p>If <i>wch</i> is not a null pointer, the <code>getcchar()</code> function splits the <code>cchar_t</code> object pointed to by <i>wcv</i> into a wide character string, attributes, and a color pair. It stores the attributes in the location pointed to by <i>attrs</i>, the color pair in the location pointed to by <i>color_pair</i>, and the wide character string in the location pointed to by <i>wch</i>.</p> <p>If <i>wch</i> is a null pointer, the <code>getcchar()</code> function simply returns the number of wide characters in the <code>cchar_t</code> object pointed to by <i>wcv</i>. The objects pointed to by <i>attrs</i> and <i>color_pair</i> are not changed.</p> |                |                                                |                     |                                                                        |              |                                                           |                   |                                                             |            |                                                                     |
| <b>PARAMETERS</b>    | <table border="0"> <tr> <td style="padding-right: 20px;"><i>wcv</i></td> <td>Is a pointer to a <code>cchar_t</code> object.</td> </tr> <tr> <td><i>wch</i></td> <td>Is a pointer to an object where a wide character string can be stored.</td> </tr> <tr> <td><i>attrs</i></td> <td>Is a pointer to an object where attributes can be stored.</td> </tr> <tr> <td><i>color_pair</i></td> <td>Is a pointer to an object where a color pair can be stored.</td> </tr> <tr> <td><i>opt</i></td> <td>Is reserved for future use. Currently, this must be a null pointer.</td> </tr> </table>                                                                                                      | <i>wcv</i>     | Is a pointer to a <code>cchar_t</code> object. | <i>wch</i>          | Is a pointer to an object where a wide character string can be stored. | <i>attrs</i> | Is a pointer to an object where attributes can be stored. | <i>color_pair</i> | Is a pointer to an object where a color pair can be stored. | <i>opt</i> | Is reserved for future use. Currently, this must be a null pointer. |
| <i>wcv</i>           | Is a pointer to a <code>cchar_t</code> object.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                |                                                |                     |                                                                        |              |                                                           |                   |                                                             |            |                                                                     |
| <i>wch</i>           | Is a pointer to an object where a wide character string can be stored.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                |                                                |                     |                                                                        |              |                                                           |                   |                                                             |            |                                                                     |
| <i>attrs</i>         | Is a pointer to an object where attributes can be stored.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                |                                                |                     |                                                                        |              |                                                           |                   |                                                             |            |                                                                     |
| <i>color_pair</i>    | Is a pointer to an object where a color pair can be stored.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                |                                                |                     |                                                                        |              |                                                           |                   |                                                             |            |                                                                     |
| <i>opt</i>           | Is reserved for future use. Currently, this must be a null pointer.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                |                                                |                     |                                                                        |              |                                                           |                   |                                                             |            |                                                                     |
| <b>RETURN VALUES</b> | <p>When <i>wch</i> is a null pointer, the <code>getcchar()</code> function returns the number of wide characters in the string pointed to by <i>wcv</i> including the null terminator.</p> <p>When <i>wch</i> is not a null pointer, the <code>getcchar()</code> function returns OK on success and ERR otherwise.</p>                                                                                                                                                                                                                                                                                                                                                                         |                |                                                |                     |                                                                        |              |                                                           |                   |                                                             |            |                                                                     |
| <b>ERRORS</b>        | None                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                |                                                |                     |                                                                        |              |                                                           |                   |                                                             |            |                                                                     |
| <b>ATTRIBUTES</b>    | See <code>attributes(5)</code> for descriptions of the following attributes:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                |                                                |                     |                                                                        |              |                                                           |                   |                                                             |            |                                                                     |
|                      | <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">ATTRIBUTE TYPE</th> <th style="text-align: center;">ATTRIBUTE VALUE</th> </tr> </thead> <tbody> <tr> <td>Interface Stability</td> <td>Standard</td> </tr> <tr> <td>MT-Level</td> <td>Unsafe</td> </tr> </tbody> </table>                                                                                                                                                                                                                                                                                                                                                       | ATTRIBUTE TYPE | ATTRIBUTE VALUE                                | Interface Stability | Standard                                                               | MT-Level     | Unsafe                                                    |                   |                                                             |            |                                                                     |
| ATTRIBUTE TYPE       | ATTRIBUTE VALUE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                |                                                |                     |                                                                        |              |                                                           |                   |                                                             |            |                                                                     |
| Interface Stability  | Standard                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |                                                |                     |                                                                        |              |                                                           |                   |                                                             |            |                                                                     |
| MT-Level             | Unsafe                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                |                                                |                     |                                                                        |              |                                                           |                   |                                                             |            |                                                                     |
| <b>SEE ALSO</b>      | <code>attroff(3XCURSES)</code> , <code>can_change_color(3XCURSES)</code> , <code>libcurses(3XCURSES)</code> , <code>setcchar(3XCURSES)</code> , <code>attributes(5)</code> , <code>standards(5)</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                |                                                |                     |                                                                        |              |                                                           |                   |                                                             |            |                                                                     |

## getch(3XCURSES)

|                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |               |                                                                                                                                        |
|------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|----------------------------------------------------------------------------------------------------------------------------------------|
| <b>NAME</b>                              | getch, wgetch, mvgetch, mvwgetch – get a single-byte character from the terminal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |               |                                                                                                                                        |
| <b>SYNOPSIS</b>                          | <pre>cc [ flag... ] file... -I /usr/xpg4/include -L /usr/xpg4/lib \ -R /usr/xpg4/lib -lcurses [ library... ]  c89 [ flag... ] file... -lcurses [ library... ]  #include &lt;curses.h&gt;  int getch(void);  int wgetch(WINDOW *win);  int mvgetch(int y, int x);  int mvwgetch(WINDOW *win, int y, int x);</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |               |                                                                                                                                        |
| <b>PARAMETERS</b>                        | <p><i>win</i> Is a pointer to the window associated with the terminal from which the character is to be read.</p> <p><i>y</i> Is the y (row) coordinate for the position of the character to be read.</p> <p><i>x</i> Is the x (column) coordinate for the position of the character to be read.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |               |                                                                                                                                        |
| <b>DESCRIPTION</b>                       | <p>These functions read a single-byte character from the terminal associated with the current or specified window. The results are unspecified if the input is not a single-byte character. If keypad(3XCURSES) is enabled, these functions respond to the pressing of a function key by returning the corresponding <code>KEY_</code> value defined in <code>&lt;curses.h&gt;</code></p> <p>Processing of terminal input is subject to the general rules described on the keypad(3XCURSES) manual page.</p> <p>If echoing is enabled, then the character is echoed as though it were provided as an input argument to <code>addch(3XCURSES)</code>, except for the following characters:</p> <table><tr><td><code>&lt;backspace&gt;</code></td><td>The input is interpreted as follows: unless the cursor already was in column 0, <code>&lt;backspace&gt;</code> moves the cursor one column toward the start of the current line and any characters after the <code>&lt;backspace&gt;</code> are added or inserted starting there. The character at the resulting cursor position is then deleted as though <code>delch(3XCURSES)</code> were called, except that if the cursor was originally in the first column of the line, the user is alerted as though <code>beep(3XCURSES)</code> were called.</td></tr><tr><td>Function keys</td><td>The user is alerted as though <code>beep()</code> were called. Information concerning the function keys is not returned to the caller.</td></tr></table> <p>If the current or specified window is not a pad, and it has been moved modified since the last refresh operation, then it will be refreshed before another character is read.</p> | <code>&lt;backspace&gt;</code> | The input is interpreted as follows: unless the cursor already was in column 0, <code>&lt;backspace&gt;</code> moves the cursor one column toward the start of the current line and any characters after the <code>&lt;backspace&gt;</code> are added or inserted starting there. The character at the resulting cursor position is then deleted as though <code>delch(3XCURSES)</code> were called, except that if the cursor was originally in the first column of the line, the user is alerted as though <code>beep(3XCURSES)</code> were called. | Function keys | The user is alerted as though <code>beep()</code> were called. Information concerning the function keys is not returned to the caller. |
| <code>&lt;backspace&gt;</code>           | The input is interpreted as follows: unless the cursor already was in column 0, <code>&lt;backspace&gt;</code> moves the cursor one column toward the start of the current line and any characters after the <code>&lt;backspace&gt;</code> are added or inserted starting there. The character at the resulting cursor position is then deleted as though <code>delch(3XCURSES)</code> were called, except that if the cursor was originally in the first column of the line, the user is alerted as though <code>beep(3XCURSES)</code> were called.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |               |                                                                                                                                        |
| Function keys                            | The user is alerted as though <code>beep()</code> were called. Information concerning the function keys is not returned to the caller.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |               |                                                                                                                                        |
| <b>Constant Values for Function Keys</b> | The following is a list of tokens for function keys that are returned by the <code>getch()</code> set of functions if keypad handling is enabled (some terminals may not support all tokens).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |               |                                                                                                                                        |

| Constant          | Description                                   |
|-------------------|-----------------------------------------------|
| KEY_BREAK         | Break key                                     |
| KEY_DOWN          | The down arrow key                            |
| KEY_UP            | The up arrow key                              |
| KEY_LEFT          | The left arrow key                            |
| KEY_RIGHT         | The right arrow key                           |
| KEY_HOME          | Home key                                      |
| KEY_BACKSPACE     | Backspace                                     |
| KEY_F0            | Function keys. Space for 64 keys is reserved. |
| KEY_F( <i>n</i> ) | For $0 \leq n \leq 63$                        |
| KEY_DL            | Delete line                                   |
| KEY_IL            | Insert line                                   |
| KEY_DC            | Delete character                              |
| KEY_IC            | Insert char or enter insert mode              |
| KEY_EIC           | Exit insert char mode                         |
| KEY_CLEAR         | Clear screen                                  |
| KEY_EOS           | Clear to end of screen                        |
| KEY_EOL           | Clear to end of line                          |
| KEY_SF            | Scroll 1 line forward                         |
| KEY_SR            | Scroll 1 line backwards                       |
| KEY_NPAGE         | Next page                                     |
| KEY_PPAGE         | Previous page                                 |
| KEY_STAB          | Set tab                                       |
| KEY_CTAB          | Clear tab                                     |
| KEY_CATAB         | Clear all tabs                                |
| KEY_ENTER         | Enter or send                                 |
| KEY_SRESET        | Soft (partial) reset                          |
| KEY_RESET         | Reset or hard reset                           |
| KEY_PRINT         | Print or copy                                 |
| KEY_LL            | Home down or bottom (lower left)              |

getch(3XCURSES)

| Constant      | Description           |
|---------------|-----------------------|
| KEY_A1        | Upper left of keypad  |
| KEY_A3        | Upper right of keypad |
| KEY_B2        | Center of keypad      |
| KEY_C1        | Lower left of keypad  |
| KEY_C3        | Lower right of keypad |
| KEY_BTAB      | Back tab              |
| KEY_BEG       | Beginning key         |
| KEY_CANCEL    | Cancel key            |
| KEY_CLOSE     | Close key             |
| KEY_COMMAND   | Cmd (command) key     |
| KEY_COPY      | Copy key              |
| KEY_CREATE    | Create key            |
| KEY_END       | End key               |
| KEY_EXIT      | Exit key              |
| KEY_FIND      | Find key              |
| KEY_HELP      | Help key              |
| KEY_MARK      | Mark key              |
| KEY_MESSAGE   | Message key           |
| KEY_MOVE      | Move key              |
| KEY_NEXT      | Next object key       |
| KEY_OPEN      | Open key              |
| KEY_OPTIONS   | Options key           |
| KEY_PREVIOUS  | Previous object key   |
| KEY_REDO      | Redo key              |
| KEY_REFERENCE | Reference key         |
| KEY_REFRESH   | Refresh key           |
| KEY_REPLACE   | Replace key           |
| KEY_RESTART   | Restart key           |
| KEY_RESUME    | Resume key            |

| Constant      | Description             |
|---------------|-------------------------|
| KEY_SAVE      | Save key                |
| KEY_SBEG      | Shifted beginning key   |
| KEY_SCANCEL   | Shifted cancel key      |
| KEY_SCOMMAND  | Shifted command key     |
| KEY_SCOPY     | Shifted copy key        |
| KEY_SCREATE   | Shifted create key      |
| KEY_SDC       | Shifted delete char key |
| KEY_SDL       | Shifted delete line key |
| KEY_SELECT    | Select key              |
| KEY_SEND      | Shifted end key         |
| KEY_SEOL      | Shifted clear line key  |
| KEY_SEXIT     | Shifted exit key        |
| KEY_SFIND     | Shifted find key        |
| KEY_SHELP     | Shifted help key        |
| KEY_SHOME     | Shifted home key        |
| KEY_SIC       | Shifted input key       |
| KEY_SLEFT     | Shifted left arrow key  |
| KEY_SMESSAGES | Shifted messages key    |
| KEY_SMOVE     | Shifted move key        |
| KEY_SNEXT     | Shifted next key        |
| KEY_SOPTIONS  | Shifted options key     |
| KEY_SPREVIOUS | Shifted previous key    |
| KEY_SPRINT    | Shifted print key       |
| KEY_SREDO     | Shifted redo key        |
| KEY_SREPLACE  | Shifted replace key     |
| KEY_SRIGHT    | Shifted right arrow key |
| KEY_SRSUME    | Shifted resume key      |
| KEY_SSAVE     | Shifted save key        |
| KEY_SSUSPEND  | Shifted suspend key     |

getch(3XCURSES)

| Constant    | Description      |
|-------------|------------------|
| KEY_SUNDO   | Shifted undo key |
| KEY_SUSPEND | Suspend key      |
| KEY_UNDO    | Undo key         |

**RETURN VALUES** Upon successful completion, these functions return the single-byte character, `KEY_` value, or `ERR`. When in the nodelay mode and no data is available, `ERR` is returned.

**ERRORS** No errors are defined.

**USAGE** Applications should not define the escape key by itself as a single-character function. When using these functions, nocbreak mode (`cbreak(3XCURSES)`) and echo mode (`echo(3XCURSES)`) should not be used at the same time. Depending on the state of the terminal when each character is typed, the application may produce undesirable results.

**ATTRIBUTES** See `attributes(5)` for descriptions of the following attributes:

| ATTRIBUTE TYPE      | ATTRIBUTE VALUE |
|---------------------|-----------------|
| Interface Stability | Standard        |
| MT-Level            | Unsafe          |

**SEE ALSO** `cbreak(3XCURSES)`, `echo(3XCURSES)`, `halfdelay(3XCURSES)`, `keypad(3XCURSES)`, `libcurses(3XCURSES)`, `nodelay(3XCURSES)`, `notimeout(3XCURSES)`, `raw(3XCURSES)`, `timeout(3XCURSES)`, `attributes(5)`, `standards(5)`

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |            |                                                                      |          |                                                         |          |                                                                                |          |                                                                                   |            |                                                                                           |
|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|----------------------------------------------------------------------|----------|---------------------------------------------------------|----------|--------------------------------------------------------------------------------|----------|-----------------------------------------------------------------------------------|------------|-------------------------------------------------------------------------------------------|
| <b>NAME</b>        | getnstr, getstr, mvgetnstr, mvgetstr, mvwgetnstr, mvwgetstr, wgetnstr, wgetstr – get a multibyte character string from terminal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |            |                                                                      |          |                                                         |          |                                                                                |          |                                                                                   |            |                                                                                           |
| <b>SYNOPSIS</b>    | <pre>cc [ flag... ] file... -I /usr/xpg4/include -L /usr/xpg4/lib \ -R /usr/xpg4/lib -lcurses [ library... ]  c89 [ flag... ] file... -lcurses [ library... ]  #include &lt;curses.h&gt;  int getnstr(char *str, int n); int getstr(char *str); int mvgetnstr(int y, int x, char *str, int n); int mvgetstr(int y, int x, char *str); int mvwgetnstr(WINDOW *win, int y, int x, char *str, int n); int mvwgetstr(WINDOW *win, int y, int x, char *str); int wgetnstr(WINDOW *win, char *str, int n); int wgetstr(WINDOW *win, char *str);</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |            |                                                                      |          |                                                         |          |                                                                                |          |                                                                                   |            |                                                                                           |
| <b>DESCRIPTION</b> | <p>The <code>getstr()</code> and <code>wgetstr()</code> functions get a character string from the terminal associated with the window <code>stdscr</code> or window <code>win</code>, respectively. The <code>mvgetstr()</code> and <code>mvwgetstr()</code> functions move the cursor to the position specified in <code>stdscr</code> or <code>win</code>, respectively, then get a character string.</p> <p>These functions call <code>wgetch(3XCURSES)</code> and place each received character in <code>str</code> until a newline is received, which is also placed in <code>str</code>. The erase and kill characters set by the user are processed.</p> <p>The <code>getnstr()</code>, <code>mvgetnstr()</code>, <code>mvwgetnstr()</code> and <code>wgetnstr()</code> functions read at most <code>n</code> characters. These functions are used to prevent overflowing the input buffer.</p> <p>The <code>getnstr()</code>, <code>wgetnstr()</code>, <code>mvgetnstr()</code>, and <code>mvwgetnstr()</code> functions only return complete multibyte characters. If the area pointed to by <code>str</code> is not large enough to hold at least one character, these functions fail.</p> |            |                                                                      |          |                                                         |          |                                                                                |          |                                                                                   |            |                                                                                           |
| <b>PARAMETERS</b>  | <table border="0"> <tr> <td style="padding-right: 20px;"><i>str</i></td> <td>Is a pointer to the area where the character string is to be placed.</td> </tr> <tr> <td><i>n</i></td> <td>Is the maximum number of characters to read from input.</td> </tr> <tr> <td><i>y</i></td> <td>Is the y (row) coordinate of starting position of character string to be read.</td> </tr> <tr> <td><i>x</i></td> <td>Is the x (column) coordinate of starting position of character string to be read.</td> </tr> <tr> <td><i>win</i></td> <td>Points to the window associated with the terminal from which the character is to be read.</td> </tr> </table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <i>str</i> | Is a pointer to the area where the character string is to be placed. | <i>n</i> | Is the maximum number of characters to read from input. | <i>y</i> | Is the y (row) coordinate of starting position of character string to be read. | <i>x</i> | Is the x (column) coordinate of starting position of character string to be read. | <i>win</i> | Points to the window associated with the terminal from which the character is to be read. |
| <i>str</i>         | Is a pointer to the area where the character string is to be placed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |            |                                                                      |          |                                                         |          |                                                                                |          |                                                                                   |            |                                                                                           |
| <i>n</i>           | Is the maximum number of characters to read from input.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |            |                                                                      |          |                                                         |          |                                                                                |          |                                                                                   |            |                                                                                           |
| <i>y</i>           | Is the y (row) coordinate of starting position of character string to be read.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |            |                                                                      |          |                                                         |          |                                                                                |          |                                                                                   |            |                                                                                           |
| <i>x</i>           | Is the x (column) coordinate of starting position of character string to be read.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |            |                                                                      |          |                                                         |          |                                                                                |          |                                                                                   |            |                                                                                           |
| <i>win</i>         | Points to the window associated with the terminal from which the character is to be read.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |            |                                                                      |          |                                                         |          |                                                                                |          |                                                                                   |            |                                                                                           |

getnstr(3XCURSES)

**RETURN VALUES** On success, these functions return OK. Otherwise, they return ERR.

**ERRORS** None.

**ATTRIBUTES** See `attributes(5)` for descriptions of the following attributes:

| ATTRIBUTE TYPE      | ATTRIBUTE VALUE |
|---------------------|-----------------|
| Interface Stability | Standard        |
| MT-Level            | Unsafe          |

**SEE ALSO** `getch(3XCURSES)`, `libcurses(3XCURSES)`, `attributes(5)`, `standards(5)`

|                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>NAME</b>          | getn_wstr, get_wstr, mvgetn_wstr, mvget_wstr, mvwgetn_wstr, mvwget_wstr, wgetn_wstr, wget_wstr – get a wide character string from terminal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>SYNOPSIS</b>      | <pre>cc [ flag... ] file... -I /usr/xpg4/include -L /usr/xpg4/lib \ -R /usr/xpg4/lib -lcurses [ library... ]  c89 [ flag... ] file... -lcurses [ library... ]  #include &lt;curses.h&gt;  int getn_wstr(wint_t *wstr, int n); int get_wstr(wint_t *wstr); int mvgetn_wstr(int y, int x, wint_t *wstr, int n); int mvget_wstr(int y, int x, wint_t *wstr); int mvwgetn_wstr(WINDOW *win, int y, int x, wint_t *wstr, int n); int mvwget_wstr(WINDOW *win, int y, int x, wint_t *wstr); int wgetn_wstr(WINDOW *win, wint_t *wstr, int n); int wget_wstr(WINDOW *win, wint_t *wstr);</pre>                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>DESCRIPTION</b>   | <p>The <code>get_wstr()</code> and <code>wget_wstr()</code> functions get a wide character string from the terminal associated with the window <code>stdscr</code> or window <code>win</code>, respectively. The <code>mvget_wstr()</code> and <code>mvwget_wstr()</code> functions move the cursor to the position specified in <code>stdscr</code> or <code>win</code>, respectively, then get a wide character string.</p> <p>These functions call <code>wget_wch(3XCURSES)</code> and place each received character in <code>wstr</code> until a newline character, end-of-line character, or end-of-file character is received, which is also placed in <code>wstr</code>. The erase and kill characters set by the user are processed.</p> <p>The <code>getn_wstr()</code>, <code>mvgetn_wstr()</code>, <code>mvwgetn_wstr()</code> and <code>wgetn_wstr()</code> functions read at most <code>n</code> characters. These functions are used to prevent overflowing the input buffer.</p> |
| <b>PARAMETERS</b>    | <p><i>wstr</i> Is a pointer to the area where the character string is to be placed.</p> <p><i>n</i> Is the maximum number of characters to read from input.</p> <p><i>y</i> Is the y (row) coordinate of starting position of character string to be read.</p> <p><i>x</i> Is the x (column) coordinate of starting position of character string to be read.</p> <p><i>win</i> points to the window associated with the terminal from which the character is to be read.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>RETURN VALUES</b> | On success, these functions return OK. Otherwise, they return ERR.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>ERRORS</b>        | None.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

getn\_wstr(3XCURSES)

**ATTRIBUTES** See `attributes(5)` for descriptions of the following attributes:

| ATTRIBUTE TYPE      | ATTRIBUTE VALUE |
|---------------------|-----------------|
| Interface Stability | Standard        |
| MT-Level            | Unsafe          |

**SEE ALSO** `get_wch(3XCURSES)`, `getnstr(3XCURSES)`, `libcurses(3XCURSES)`, `attributes(5)`, `standards(5)`

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>NAME</b>        | get_wch, wget_wch, mvget_wch, mvwget_wch – get a wide character from terminal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>SYNOPSIS</b>    | <pre>cc [ flag... ] file... -I /usr/xpg4/include -L /usr/xpg4/lib \ -R /usr/xpg4/lib -lcurses [ library... ]  c89 [ flag... ] file... -lcurses [ library... ]  #include &lt;curses.h&gt;  int get_wch(wint_t *ch);  int wget_wch(WINDOW *win, wint_t *ch);  int mvget_wch(int y, int x, wint_t *ch);  int mvwget_wch(WINDOW *win, int y, int x, wint_t *ch);</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>DESCRIPTION</b> | <p>The <code>get_wch()</code> and <code>wget_wch()</code> functions get a wide character from the terminal associated with the window <code>stdscr</code> or window <code>win</code>, respectively. The <code>mvget_wch()</code> and <code>mvwget_wch()</code> functions move the cursor to the position specified in <code>stdscr</code> or <code>win</code>, respectively, then get a character.</p> <p>If the window is not a pad and has been changed since the last call to <code>refresh(3XCURSES)</code>, <code>get_wch()</code> calls <code>refresh()</code> to update the window before the next character is read.</p> <p>The setting of certain functions affects the behavior of the <code>get_wch()</code> set of functions. For example, if <code>cbreak(3XCURSES)</code> is set, characters typed by the user are immediately processed. If <code>halfdelay(3XCURSES)</code> is set, <code>get_wch()</code> waits until a character is typed or returns <code>ERR</code> if no character is typed within the specified timeout period. This timeout can also be specified for individual windows with the <code>delay</code> parameter of <code>timeout(3XCURSES)</code>. A negative value waits for input; a value of 0 returns <code>ERR</code> if no input is ready; a positive value blocks until input arrives or the time specified expires (in which case <code>ERR</code> is returned). If <code>nodelay(3XCURSES)</code> is set, <code>ERR</code> is returned if no input is waiting; if not set, <code>get_wch()</code> waits until input arrives. Each character will be echoed to the window unless <code>noecho(3XCURSES)</code> has been set.</p> <p>If keypad handling is enabled (<code>keypad(3XCURSES)</code> is <code>TRUE</code>), the token for the function key (a <code>KEY_</code> value) is stored in the object pointed to by <code>ch</code> and <code>KEY_CODE_YES</code> is returned. If a character is received that could be the beginning of a function key (for example, <code>ESC</code>), an inter-byte timer is set. If the remainder of the sequence is not received before the time expires, the character is passed through; otherwise, the value of the function key is returned. If <code>notimeout()</code> is set, the inter-byte timer is not used.</p> <p>The <code>ESC</code> key is typically a prefix key used with function keys and should not be used as a single character.</p> <p>See the <code>getch(3XCURSES)</code> manual page for a list of tokens for function keys that are returned by the <code>get_wch()</code> set of functions if keypad handling is enabled (Some terminals may not support all tokens).</p> |

get\_wch(3XCURSES)

**PARAMETERS**

|            |                                                                                                 |
|------------|-------------------------------------------------------------------------------------------------|
| <i>ch</i>  | Is a pointer to a wide integer where the returned wide character or KEY_ value can be stored.   |
| <i>win</i> | Is a pointer to the window associated with the terminal from which the character is to be read. |
| <i>y</i>   | Is the y (row) coordinate for the position of the character to be read.                         |
| <i>x</i>   | Is the x (column) coordinate for the position of the character to be read.                      |

**RETURN VALUES** When these functions successfully report the pressing of a function key, they return KEY\_CODE\_YES. When they successfully report a wide character, they return OK. Otherwise, they return ERR.

**ERRORS** None.

**ATTRIBUTES** See `attributes(5)` for descriptions of the following attributes:

| ATTRIBUTE TYPE      | ATTRIBUTE VALUE |
|---------------------|-----------------|
| Interface Stability | Standard        |
| MT-Level            | Unsafe          |

**SEE ALSO** `cbreak(3XCURSES)`, `echo(3XCURSES)`, `halfdelay(3XCURSES)`, `keypad(3XCURSES)`, `libcurses(3XCURSES)`, `nodelay(3XCURSES)`, `notimeout(3XCURSES)`, `raw(3XCURSES)`, `timeout(3XCURSES)`, `attributes(5)`, `standards(5)`

| <b>NAME</b>          | getwin, putwin – read a window from, and write a window to, a file                                                                                                                                                                                                                                                                                                                                                                                                                                            |                |                 |                     |          |          |        |
|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-----------------|---------------------|----------|----------|--------|
| <b>SYNOPSIS</b>      | <pre>cc [ flag... ] file... -I /usr/xpg4/include -L /usr/xpg4/lib \ -R /usr/xpg4/lib -lcurses [ library... ]  c89 [ flag... ] file... -lcurses [ library... ]  #include &lt;curses.h&gt;  WINDOW *getwin(FILE *filep);  int putwin(WINDOW *win, FILE *filep);</pre>                                                                                                                                                                                                                                           |                |                 |                     |          |          |        |
| <b>DESCRIPTION</b>   | <p>The <code>getwin()</code> function reads window-related data (written earlier by <code>putwin()</code>) from the <code>stdio</code> stream pointed to by <code>filep</code>. It then creates and initializes a new window using that data.</p> <p>The <code>putwin()</code> function writes all the data associated with the window pointed to by <code>win</code> to the <code>stdio</code> stream pointed to by <code>filep</code>. The <code>getwin()</code> function can later retrieve this data.</p> |                |                 |                     |          |          |        |
| <b>PARAMETERS</b>    | <p><code>filep</code>      Is a pointer to a <code>stdio</code> stream.</p> <p><code>win</code>         Is a pointer to a window.</p>                                                                                                                                                                                                                                                                                                                                                                         |                |                 |                     |          |          |        |
| <b>RETURN VALUES</b> | <p>On success, the <code>getwin()</code> function returns a pointer to the new window created. Otherwise, it returns a null pointer.</p> <p>On success, the <code>putwin()</code> function returns <code>OK</code>. Otherwise, it returns <code>ERR</code>.</p>                                                                                                                                                                                                                                               |                |                 |                     |          |          |        |
| <b>ERRORS</b>        | None.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                |                 |                     |          |          |        |
| <b>ATTRIBUTES</b>    | See <code>attributes(5)</code> for descriptions of the following attributes:                                                                                                                                                                                                                                                                                                                                                                                                                                  |                |                 |                     |          |          |        |
|                      | <table border="1"> <thead> <tr> <th>ATTRIBUTE TYPE</th> <th>ATTRIBUTE VALUE</th> </tr> </thead> <tbody> <tr> <td>Interface Stability</td> <td>Standard</td> </tr> <tr> <td>MT-Level</td> <td>Unsafe</td> </tr> </tbody> </table>                                                                                                                                                                                                                                                                              | ATTRIBUTE TYPE | ATTRIBUTE VALUE | Interface Stability | Standard | MT-Level | Unsafe |
| ATTRIBUTE TYPE       | ATTRIBUTE VALUE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                |                 |                     |          |          |        |
| Interface Stability  | Standard                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                |                 |                     |          |          |        |
| MT-Level             | Unsafe                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                |                 |                     |          |          |        |
| <b>SEE ALSO</b>      | <code>libcurses(3XCURSES)</code> , <code>scr_dump(3XCURSES)</code> , <code>attributes(5)</code> , <code>standards(5)</code>                                                                                                                                                                                                                                                                                                                                                                                   |                |                 |                     |          |          |        |

## halfdelay(3XCURSES)

**NAME** halfdelay – enable/disable half-delay mode

**SYNOPSIS**

```
cc [flag...] file... -I /usr/xpg4/include -L /usr/xpg4/lib \
-R /usr/xpg4/lib -lcurses [library...]

c89 [flag...] file... -lcurses [library...]

#include <curses.h>

int halfdelay(int tenths);
```

**DESCRIPTION** The halfdelay() function is similar to cbreak(3XCURSES) in that when set, characters typed by the user are immediately processed by the program. The difference is that ERR is returned if no input is received after *tenths* tenths seconds.

The nocbreak(3XCURSES) function should be used to leave half-delay mode.

**PARAMETERS** *tenths* Is the number of tenths of seconds for which to block input (1 to 255).

**RETURN VALUES** On success, the halfdelay() function returns OK. Otherwise, it returns ERR.

**ERRORS** None.

**ATTRIBUTES** See attributes(5) for descriptions of the following attributes:

| ATTRIBUTE TYPE      | ATTRIBUTE VALUE |
|---------------------|-----------------|
| Interface Stability | Standard        |
| MT-Level            | Unsafe          |

**SEE ALSO** cbreak(3XCURSES), libcurses(3XCURSES), attributes(5), standards(5)

| <b>NAME</b>          | has_ic, has_il – determine insert/delete character/line capability                                                                                                                                                                                                                                                   |                |                 |                     |          |          |        |
|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-----------------|---------------------|----------|----------|--------|
| <b>SYNOPSIS</b>      | <pre>cc [ flag... ] file... -I /usr/xpg4/include -L /usr/xpg4/lib \ -R /usr/xpg4/lib -lcurses [ library... ]  c89 [ flag... ] file... -lcurses [ library... ]  #include &lt;curses.h&gt;  bool has_ic(void);  bool has_il(void);</pre>                                                                               |                |                 |                     |          |          |        |
| <b>DESCRIPTION</b>   | <p>The <code>has_ic()</code> function determines whether or not the terminal has insert/delete character capability.</p> <p>The <code>has_il()</code> function determines whether or not the terminal has insert/delete line capability.</p>                                                                         |                |                 |                     |          |          |        |
| <b>RETURN VALUES</b> | <p>The <code>has_ic()</code> function returns <code>TRUE</code> if the terminal has insert/delete character capability and <code>FALSE</code> otherwise.</p> <p>The <code>has_il()</code> function returns <code>TRUE</code> if the terminal has insert/delete line capability and <code>FALSE</code> otherwise.</p> |                |                 |                     |          |          |        |
| <b>ERRORS</b>        | None.                                                                                                                                                                                                                                                                                                                |                |                 |                     |          |          |        |
| <b>ATTRIBUTES</b>    | See <code>attributes(5)</code> for descriptions of the following attributes:                                                                                                                                                                                                                                         |                |                 |                     |          |          |        |
|                      | <table border="1"> <thead> <tr> <th>ATTRIBUTE TYPE</th> <th>ATTRIBUTE VALUE</th> </tr> </thead> <tbody> <tr> <td>Interface Stability</td> <td>Standard</td> </tr> <tr> <td>MT-Level</td> <td>Unsafe</td> </tr> </tbody> </table>                                                                                     | ATTRIBUTE TYPE | ATTRIBUTE VALUE | Interface Stability | Standard | MT-Level | Unsafe |
| ATTRIBUTE TYPE       | ATTRIBUTE VALUE                                                                                                                                                                                                                                                                                                      |                |                 |                     |          |          |        |
| Interface Stability  | Standard                                                                                                                                                                                                                                                                                                             |                |                 |                     |          |          |        |
| MT-Level             | Unsafe                                                                                                                                                                                                                                                                                                               |                |                 |                     |          |          |        |
| <b>SEE ALSO</b>      | <code>libcurses(3XCURSES)</code> , <code>attributes(5)</code> , <code>standards(5)</code>                                                                                                                                                                                                                            |                |                 |                     |          |          |        |

## hline(3XCURSES)

|                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>NAME</b>          | <code>hline</code> , <code>mvhline</code> , <code>mvvline</code> , <code>mvwhline</code> , <code>mvwvline</code> , <code>vline</code> , <code>whline</code> , <code>wvline</code> – use single-byte characters (and renditions) to draw lines                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>SYNOPSIS</b>      | <pre>cc [ flag... ] file... -I /usr/xpg4/include -L /usr/xpg4/lib \ -R /usr/xpg4/lib -lcurses [ library... ]  c89 [ flag... ] file... -lcurses [ library... ]  #include &lt;curses.h&gt;  int hline(chtype ch, int n); int mvhline(int y, int x, chtype ch, int n); int mvvline(int y, int x, chtype ch, int n); int mvwhline(WINDOW *win, int y, int x, chtype ch, int n); int mvwvline(WINDOW *win, int y, int x, chtype ch, int n); int vline(chtype ch, int n); int whline(WINDOW *win, chtype ch, int n); int wvline(WINDOW *win, chtype ch, int n);</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>DESCRIPTION</b>   | <p>The <code>hline()</code>, <code>vline()</code>, <code>whline()</code>, <code>wvline()</code> functions draw a horizontal or vertical line, in either the window <code>stdscr</code> or <code>win</code> starting at the current cursor position. The line is drawn using the character <code>ch</code> and is a maximum of <code>n</code> positions long, or as many as will fit into the window. If <code>ch</code> is 0 (zero), the default horizontal or vertical character is used.</p> <p>The <code>mvhline()</code>, <code>mvvline()</code>, <code>mvwhline()</code>, <code>mvwvline()</code> functions are similar to the previous group of functions but the line begins at cursor position specified by <code>x</code> and <code>y</code>.</p> <p>The functions with names ending with <code>hline()</code> draw horizontal lines proceeding towards the last column of the same line. The functions with names ending with <code>vline()</code> draw vertical lines proceeding towards the last column of the same line.</p> <p>These functions do not change the position of the cursor.</p> |
| <b>PARAMETERS</b>    | <p><code>ch</code> Is the character used to draw the line.</p> <p><code>n</code> Is the maximum number of characters in the line.</p> <p><code>y</code> Is the <code>y</code> (row) coordinate for the start of the line.</p> <p><code>x</code> Is the <code>x</code> (column) coordinate for the start of the line.</p> <p><code>win</code> Is a pointer to a window.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>RETURN VALUES</b> | On success, these functions return OK. Otherwise, they return ERR.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>ERRORS</b>        | None                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

hline(3XCURSES)

**ATTRIBUTES** See `attributes(5)` for descriptions of the following attributes:

| ATTRIBUTE TYPE      | ATTRIBUTE VALUE |
|---------------------|-----------------|
| Interface Stability | Standard        |
| MT-Level            | Unsafe          |

**SEE ALSO** `border(3XCURSES)`, `border_set(3XCURSES)`, `hline_set(3XCURSES)`, `libcurses(3XCURSES)`, `attributes(5)`, `standards(5)`

## hline\_set(3XCURSES)

|                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                  |                                                 |                |                                                  |                |                                                      |                |                                                         |                  |                           |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|-------------------------------------------------|----------------|--------------------------------------------------|----------------|------------------------------------------------------|----------------|---------------------------------------------------------|------------------|---------------------------|
| <b>NAME</b>          | <code>hline_set</code> , <code>mvhline_set</code> , <code>mvvline_set</code> , <code>mvwhline_set</code> , <code>mvwvline_set</code> , <code>vline_set</code> , <code>whline_set</code> , <code>wvline_set</code> – use complex characters (and renditions) to draw lines                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                  |                                                 |                |                                                  |                |                                                      |                |                                                         |                  |                           |
| <b>SYNOPSIS</b>      | <pre>cc [ flag... ] file... -I /usr/xpg4/include -L /usr/xpg4/lib \ -R /usr/xpg4/lib -lcurses [ library... ]  c89 [ flag... ] file... -lcurses [ library... ]  #include &lt;curses.h&gt;  int hline_set(const cchar_t *ch, int n);  int mvhline_set(int y, int x, const cchar_t *wch, int n);  int mvvline_set(int y, int x, const cchar_t *wch, int n);  int mvwhline_set(WINDOW *win, int y, int x, const cchar_t *wch, int n);  int mvwvline_set(WINDOW *win, int y, int x, const cchar_t *wch, int n);  int vline_set(const cchar_t *wch, int n);  int whline_set(WINDOW *win, const cchar_t *wch, int n);  int wvline_set(WINDOW *win, const cchar_t *wch, int n);</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                  |                                                 |                |                                                  |                |                                                      |                |                                                         |                  |                           |
| <b>DESCRIPTION</b>   | <p>The <code>hline_set()</code>, <code>vline_set()</code>, <code>whline_set()</code>, <code>wvline_set()</code> functions draw a line, in either the window <code>stdscr</code> or <code>win</code> starting at the current cursor position. The line is drawn using the character <code>wch</code> and is a maximum of <code>n</code> positions long, or as many as will fit into the window. If <code>wch</code> is a null pointer, the default horizontal or vertical character is used.</p> <p>The <code>mvhline_set()</code>, <code>mvvline_set()</code>, <code>mvwhline_set()</code>, <code>mvwvline_set()</code> functions are similar to the previous group of functions but the line begins at cursor position specified by <code>x</code> and <code>y</code>.</p> <p>The functions with names ending with <code>hline_set()</code> draw horizontal lines proceeding towards the last column of the same line. The functions with names ending with <code>vline_set()</code> draw vertical lines proceeding towards the last column of the same line.</p> <p>These functions do not change the position of the cursor.</p> |                  |                                                 |                |                                                  |                |                                                      |                |                                                         |                  |                           |
| <b>PARAMETERS</b>    | <table><tr><td><code>wch</code></td><td>Is the complex character used to draw the line.</td></tr><tr><td><code>n</code></td><td>Is the maximum number of characters in the line.</td></tr><tr><td><code>y</code></td><td>Is the y (row) coordinate for the start of the line.</td></tr><tr><td><code>x</code></td><td>Is the x (column) coordinate for the start of the line.</td></tr><tr><td><code>win</code></td><td>Is a pointer to a window.</td></tr></table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <code>wch</code> | Is the complex character used to draw the line. | <code>n</code> | Is the maximum number of characters in the line. | <code>y</code> | Is the y (row) coordinate for the start of the line. | <code>x</code> | Is the x (column) coordinate for the start of the line. | <code>win</code> | Is a pointer to a window. |
| <code>wch</code>     | Is the complex character used to draw the line.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                  |                                                 |                |                                                  |                |                                                      |                |                                                         |                  |                           |
| <code>n</code>       | Is the maximum number of characters in the line.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                  |                                                 |                |                                                  |                |                                                      |                |                                                         |                  |                           |
| <code>y</code>       | Is the y (row) coordinate for the start of the line.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                  |                                                 |                |                                                  |                |                                                      |                |                                                         |                  |                           |
| <code>x</code>       | Is the x (column) coordinate for the start of the line.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                  |                                                 |                |                                                  |                |                                                      |                |                                                         |                  |                           |
| <code>win</code>     | Is a pointer to a window.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                  |                                                 |                |                                                  |                |                                                      |                |                                                         |                  |                           |
| <b>RETURN VALUES</b> | On success, these functions return OK. Otherwise, they return ERR.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                  |                                                 |                |                                                  |                |                                                      |                |                                                         |                  |                           |

hline\_set(3XCURSES)

**ERRORS** None.

**ATTRIBUTES** See `attributes(5)` for descriptions of the following attributes:

| ATTRIBUTE TYPE      | ATTRIBUTE VALUE |
|---------------------|-----------------|
| Interface Stability | Standard        |
| MT-Level            | Unsafe          |

**ATTRIBUTES** See `attributes(5)` for descriptions of the following attributes:

| ATTRIBUTE TYPE      | ATTRIBUTE VALUE |
|---------------------|-----------------|
| Interface Stability | Standard        |
| MT-Level            | Unsafe          |

**ATTRIBUTES** See `attributes(5)` for descriptions of the following attributes:

| ATTRIBUTE TYPE      | ATTRIBUTE VALUE |
|---------------------|-----------------|
| Interface Stability | Standard        |
| MT-Level            | Unsafe          |

**SEE ALSO** `border(3XCURSES)`, `border_set(3XCURSES)`, `hline(3XCURSES)`, `libcurses(3XCURSES)`, `attributes(5)`, `standards(5)`

idcok(3XCURSES)

**NAME** | idcok – enable/disable hardware insert-character and delete-character features

**SYNOPSIS** | 

```
cc [flag...] file... -I /usr/xpg4/include -L /usr/xpg4/lib \
-R /usr/xpg4/lib -lcurses [library...]

c89 [flag...] file... -lcurses [library...]

#include <curses.h>

void idcok(WINDOW *win, bool bf);
```

**DESCRIPTION** | The `idcok()` function enables or disables the use of hardware insert-character and delete-character features in *win*. If *bf* is set to `TRUE`, the use of these features in *win* is enabled (if the terminal is equipped). If *bf* is set to `FALSE`, their use in *win* is disabled.

**PARAMETERS** | *win* Is a pointer to a window.  
*bf* Is a Boolean expression.

**RETURN VALUES** | The `idcok()` function does not return a value.

**ERRORS** | None.

**ATTRIBUTES** | See `attributes(5)` for descriptions of the following attributes:

| ATTRIBUTE TYPE      | ATTRIBUTE VALUE |
|---------------------|-----------------|
| Interface Stability | Standard        |
| MT-Level            | Unsafe          |

**SEE ALSO** | `clearok(3XCURSES)`, `doupdate(3XCURSES)`, `libcurses(3XCURSES)`, `attributes(5)`, `standards(5)`

**NAME** immedok – call refresh on changes to window

**SYNOPSIS**

```
cc [flag...] file... -I /usr/xpg4/include -L /usr/xpg4/lib \
-R /usr/xpg4/lib -lcurses [library...]

c89 [flag...] file... -lcurses [library...]

#include <curses.h>

int immedok(WINDOW *win, bool bf);
```

**DESCRIPTION** If *bf* is TRUE, immedok() calls refresh(3XCURSES) if any change to the window image is made (for example, through functions such as addch(3XCURSES), clrtoobot(3XCURSES), and scl(3XCURSES)). Repeated calls to refresh() may affect performance negatively. The immedok() function is disabled by default.

**PARAMETERS** *win* Is a pointer to the window that is to be refreshed.  
*bf* Is a Boolean expression.

**RETURN VALUES** The immedok() function does not return a value.

**ERRORS** None.

**ATTRIBUTES** See attributes(5) for descriptions of the following attributes:

| ATTRIBUTE TYPE      | ATTRIBUTE VALUE |
|---------------------|-----------------|
| Interface Stability | Standard        |
| MT-Level            | Unsafe          |

**SEE ALSO** addch(3XCURSES), clearok(3XCURSES), clrtoobot(3XCURSES), douupdate(3XCURSES), libcurses(3XCURSES), scl(3XCURSES), attributes(5), standards(5)

## inch(3XCURSES)

| <b>NAME</b>          | inch, mvinch, mvwinch, winch – return a single-byte character (with rendition)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                |                 |                     |          |          |        |
|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-----------------|---------------------|----------|----------|--------|
| <b>SYNOPSIS</b>      | <pre>cc [ flag... ] file... -I /usr/xpg4/include -L /usr/xpg4/lib \ -R /usr/xpg4/lib -lcurses [ library... ]  c89 [ flag... ] file... -lcurses [ library... ]  #include &lt;curses.h&gt;  ctype <b>inch</b>(void);  ctype <b>mvinch</b>(int <i>y</i>, int <i>x</i>);  ctype <b>mvwinch</b>(WINDOW *<i>win</i>, int <i>y</i>, int <i>x</i>);  ctype <b>winch</b>(WINDOW *<i>win</i>);</pre>                                                                                                                                                                                                                                                                                                                                                                                |                |                 |                     |          |          |        |
| <b>DESCRIPTION</b>   | <p>The <code>inch()</code> and <code>winch()</code> functions return the <code>ctype</code> character located at the current cursor position of the <code>stdscr</code> window and window <i>win</i>, respectively. The <code>mvinch()</code> and <code>mvwinch()</code> functions return the <code>ctype</code> character located at the position indicated by the <i>x</i> (column) and <i>y</i> (row) parameters (the former in the <code>stdscr</code> window; the latter in window <i>win</i>).</p> <p>The complete character/attribute pair will be returned. The character or attributes can be extracted by performing a bitwise AND on the returned value, using the constants <code>A_CHARTEXT</code>, <code>A_ATTRIBUTES</code>, and <code>A_COLOR</code>.</p> |                |                 |                     |          |          |        |
| <b>PARAMETERS</b>    | <p><i>y</i> Is the <i>y</i> (row) coordinate of the position of the character to be returned.</p> <p><i>x</i> Is the <i>x</i> (column) coordinate of the position of the character to be returned.</p> <p><i>win</i> Is a pointer to the window that contains the character to be returned.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                |                 |                     |          |          |        |
| <b>RETURN VALUES</b> | On success, these functions return the specified character and rendition. Otherwise, they return <code>ERR</code> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |                 |                     |          |          |        |
| <b>ERRORS</b>        | None.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                |                 |                     |          |          |        |
| <b>ATTRIBUTES</b>    | See <code>attributes(5)</code> for descriptions of the following attributes:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                |                 |                     |          |          |        |
|                      | <table border="1"><thead><tr><th>ATTRIBUTE TYPE</th><th>ATTRIBUTE VALUE</th></tr></thead><tbody><tr><td>Interface Stability</td><td>Standard</td></tr><tr><td>MT-Level</td><td>Unsafe</td></tr></tbody></table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | ATTRIBUTE TYPE | ATTRIBUTE VALUE | Interface Stability | Standard | MT-Level | Unsafe |
| ATTRIBUTE TYPE       | ATTRIBUTE VALUE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                |                 |                     |          |          |        |
| Interface Stability  | Standard                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                |                 |                     |          |          |        |
| MT-Level             | Unsafe                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                |                 |                     |          |          |        |
| <b>SEE ALSO</b>      | <code>addch(3XCURSES)</code> , <code>attroff(3XCURSES)</code> , <code>libcurses(3XCURSES)</code> , <code>attributes(5)</code> , <code>standards(5)</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                |                 |                     |          |          |        |

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>NAME</b>        | inchnstr, inchnstr, mvinchnstr, mvinchstr, mvwinchnstr, mvwinchstr, winchnstr, winchstr – retrieve a single-byte character string (with rendition)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>SYNOPSIS</b>    | <pre>cc [ flag... ] file... -I /usr/xpg4/include -L /usr/xpg4/lib \ -R /usr/xpg4/lib -lcurses [ library... ]  c89 [ flag... ] file... -lcurses [ library... ]  #include &lt;curses.h&gt;  int inchnstr(chtype *chstr, int n); int inchnstr(chtype *chstr); int mvinchnstr(int y, int x, chtype *chstr, int n); int mvinchstr(int y, int x, chtype *chstr); int mvwinchnstr(WINDOW *win, int y, int x, chtype *chstr, int n); int mvwinchstr(WINDOW *win, int y, int x, chtype *chstr); int winchnstr(WINDOW *win, chtype *chstr, int n); int winchstr(WINDOW *win, chtype *chstr);</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>DESCRIPTION</b> | <p>The inchnstr() and winchstr() functions retrieve the character string (with rendition) starting at the current cursor position of the stdscr window and window win, respectively, and ending at the right margin. The mvinchstr() and mvwinchstr() functions retrieve the character string located at the position indicated by the x (column) and y (row) parameters (the former in the stdscr window; the latter in window win).</p> <p>The inchnstr(), winchnstr(), mvinchnstr(), and mvwinchnstr() functions retrieve at most n characters from the window stdscr and win, respectively. The former two functions retrieve the string, starting at the current cursor position; the latter two commands retrieve the string, starting at the position specified by the x and y parameters.</p> <p>All these functions store the retrieved character string in the object pointed to by chstr.</p> <p>The complete character/attribute pair is retrieved. The character or attributes can be extracted by performing a bitwise AND on the retrieved value, using the constants A_CHARTEXT, A_ATTRIBUTES, and A_COLOR. The character string can also be retrieved without attributes by using instr(3XCURSES) set of functions.</p> |
| <b>PARAMETERS</b>  | <p><i>chstr</i> Is a pointer to an object that can hold the retrieved character string.</p> <p><i>n</i> Is the number of characters not to exceed when retrieving <i>chstr</i>.</p> <p><i>y</i> Is the y (row) coordinate of the starting position of the string to be retrieved.</p> <p><i>x</i> Is the x (column) coordinate of the starting position of the string to be retrieved.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

inchstr(3XCURSES)

*win* Is a pointer to the window in which the string is to be retrieved.

**RETURN VALUES** On success, these functions return OK. Otherwise, they return ERR.

**ERRORS** None.

**ATTRIBUTES** See `attributes(5)` for descriptions of the following attributes:

| ATTRIBUTE TYPE      | ATTRIBUTE VALUE |
|---------------------|-----------------|
| Interface Stability | Standard        |
| MT-Level            | Unsafe          |

**SEE ALSO** `inch(3XCURSES)`, `innstr(3XCURSES)`, `libcurses(3XCURSES)`, `attributes(5)`, `standards(5)`

**NAME** initscr, newterm – screen initialization functions

**SYNOPSIS** `cc [ flag... ] file... -I /usr/xpg4/include -L /usr/xpg4/lib \`  
`-R /usr/xpg4/lib -lcurses [ library... ]`

`c89 [ flag... ] file... -lcurses [ library... ]`

```
#include <curses.h>
WINDOW *initscr(void);
SCREEN *newterm(char *type, FILE *outfp, FILE *infp);
```

**PARAMETERS**

*type* Is a string defining the terminal type to be used in place of TERM.

*outfp* Is a pointer to a file to be used for output to the terminal.

*infp* Is the pointer to a file to be used for input to the terminal.

**DESCRIPTION**

The `initscr()` function initializes X/Open Curses data structures, determines the terminal type, and ensures the first call to `refresh(3XCURSES)` clears the screen.

The `newterm()` function opens a new terminal with each call. It should be used instead of `initscr()` when the program interacts with more than one terminal. It returns a variable of type `SCREEN`, which should be used for later reference to that terminal. Before program termination, `endwin()` should be called for each terminal.

The only functions that you can call before calling `initscr()` or `newterm()` are `filter(3XCURSES)`, `riproffline(3XCURSES)`, `slk_init(3XCURSES)`, and `use_env(3XCURSES)`.

**RETURN VALUES**

On success, the `initscr()` function returns a pointer to `stdscr`; otherwise, `initscr()` does not return.

On success, the `newterm()` function returns a pointer to the specified terminal; otherwise, a null pointer is returned.

**ERRORS** None.

**ATTRIBUTES** See `attributes(5)` for descriptions of the following attributes:

| ATTRIBUTE TYPE      | ATTRIBUTE VALUE |
|---------------------|-----------------|
| Interface Stability | Standard        |
| MT-Level            | Unsafe          |

initscr(3XCURSES)

**SEE ALSO** del\_curterm(3XCURSES), delscreen(3XCURSES), doupdate(3XCURSES),  
endwin(3XCURSES), filter(3XCURSES), libcurses(3XCURSES),  
slk\_attroff(3XCURSES), use\_env(3XCURSES), attributes(5), standards(5)

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |            |                                                                                   |          |                                                                        |          |                                                                                          |          |                                                                                             |            |                                                                    |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----------------------------------------------------------------------------------|----------|------------------------------------------------------------------------|----------|------------------------------------------------------------------------------------------|----------|---------------------------------------------------------------------------------------------|------------|--------------------------------------------------------------------|
| <b>NAME</b>        | innstr, instr, mvinnstr, mvinstr, mvwinstr, mvwinstr, winstr – retrieve a multibyte character string (without rendition)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |            |                                                                                   |          |                                                                        |          |                                                                                          |          |                                                                                             |            |                                                                    |
| <b>SYNOPSIS</b>    | <pre>cc [ flag... ] file... -I /usr/xpg4/include -L /usr/xpg4/lib \ -R /usr/xpg4/lib -lcurses [ library... ]  c89 [ flag... ] file... -lcurses [ library... ]  #include &lt;curses.h&gt;  int innstr(char *str, int n); int instr(char *str); int mvinnstr(int y, int x, char *str, int n); int mvinstr(int y, int x, char *str); int mvwinstr(WINDOW *win, int y, int x, char *str, int n); int mvwinstr(WINDOW *win, int y, int x, char *str); int winstr(WINDOW *win, char *str); int winstr(WINDOW *win, char *str, int n);</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |            |                                                                                   |          |                                                                        |          |                                                                                          |          |                                                                                             |            |                                                                    |
| <b>PARAMETERS</b>  | <table border="0"> <tr> <td style="padding-right: 20px;"><i>str</i></td> <td>Is a pointer to an object that can hold the retrieved multibyte character string.</td> </tr> <tr> <td><i>n</i></td> <td>Is the number of characters not to exceed when retrieving <i>str</i>.</td> </tr> <tr> <td><i>y</i></td> <td>Is the <i>y</i> (row) coordinate of the starting position of the string to be retrieved.</td> </tr> <tr> <td><i>x</i></td> <td>Is the <i>x</i> (column) coordinate of the starting position of the string to be retrieved.</td> </tr> <tr> <td><i>win</i></td> <td>Is a pointer to the window in which the string is to be retrieved.</td> </tr> </table>                                                                                                                                                                                                                                                                                                                                  | <i>str</i> | Is a pointer to an object that can hold the retrieved multibyte character string. | <i>n</i> | Is the number of characters not to exceed when retrieving <i>str</i> . | <i>y</i> | Is the <i>y</i> (row) coordinate of the starting position of the string to be retrieved. | <i>x</i> | Is the <i>x</i> (column) coordinate of the starting position of the string to be retrieved. | <i>win</i> | Is a pointer to the window in which the string is to be retrieved. |
| <i>str</i>         | Is a pointer to an object that can hold the retrieved multibyte character string.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |            |                                                                                   |          |                                                                        |          |                                                                                          |          |                                                                                             |            |                                                                    |
| <i>n</i>           | Is the number of characters not to exceed when retrieving <i>str</i> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |            |                                                                                   |          |                                                                        |          |                                                                                          |          |                                                                                             |            |                                                                    |
| <i>y</i>           | Is the <i>y</i> (row) coordinate of the starting position of the string to be retrieved.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |            |                                                                                   |          |                                                                        |          |                                                                                          |          |                                                                                             |            |                                                                    |
| <i>x</i>           | Is the <i>x</i> (column) coordinate of the starting position of the string to be retrieved.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |            |                                                                                   |          |                                                                        |          |                                                                                          |          |                                                                                             |            |                                                                    |
| <i>win</i>         | Is a pointer to the window in which the string is to be retrieved.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |            |                                                                                   |          |                                                                        |          |                                                                                          |          |                                                                                             |            |                                                                    |
| <b>DESCRIPTION</b> | <p>The <code>instr()</code> and <code>winstr()</code> functions retrieve a multibyte character string (without attributes) starting at the current cursor position of the <code>stdscr</code> window and window <i>win</i>, respectively, and ending at the right margin. The <code>mvinstr()</code> and <code>mvwinstr()</code> functions retrieve a multibyte character string located at the position indicated by the <i>x</i> (column) and <i>y</i> (row) parameters (the former in the <code>stdscr</code> window; the latter in window <i>win</i>).</p> <p>The <code>innstr()</code>, <code>winnstr()</code>, <code>mvinnstr()</code>, and <code>mvwinstr()</code> functions retrieve at most <i>n</i> characters from the window <code>stdscr</code> and <i>win</i>, respectively. The former two functions retrieve the string starting at the current cursor position; the latter two commands return the string, starting at the position specified by the <i>x</i> and <i>y</i> parameters.</p> |            |                                                                                   |          |                                                                        |          |                                                                                          |          |                                                                                             |            |                                                                    |

innstr(3XCURSES)

All these functions store the retrieved string in the object pointed to by *str*. They only store complete multibyte characters. If the area pointed to by *str* is not large enough to hold at least one character, these functions fail.

Only the character portion of the character/rendition pair is returned. To return the complete character/rendition pair, use `winchstr()`.

**ERRORS** OK Successful completion.

ERR An error occurred.

**USAGE** All functions except `winnstr()` may be macros.

**ATTRIBUTES** See `attributes(5)` for descriptions of the following attributes:

| ATTRIBUTE TYPE      | ATTRIBUTE VALUE |
|---------------------|-----------------|
| Interface Stability | Standard        |
| MT-Level            | Unsafe          |

**SEE ALSO** `inch(3XCURSES)`, `inchstr(3XCURSES)`, `libcurses(3XCURSES)`, `attributes(5)`, `standards(5)`

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>NAME</b>        | innwstr, inwstr, mvinnwstr, mvinwstr, mvwinnwstr, mvwinwstr, winnwstr, winwstr – retrieve a wide character string (without rendition)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>SYNOPSIS</b>    | <pre>cc [ flag... ] file... -I /usr/xpg4/include -L /usr/xpg4/lib \ -R /usr/xpg4/lib -lcurses [ library... ]  c89 [ flag... ] file... -lcurses [ library... ]  #include &lt;curses.h&gt;  int innwstr(wchar_t *wstr, int n); int inwstr(wchar_t *wstr); int mvinnwstr(int y, int x, wchar_t *wstr, int n); int mvinwstr(int y, int x, wchar_t *wstr); int mvwinnwstr(WINDOW*win, int y, int x, wchar_t *wstr, int n); int mvwinwstr(WINDOW*win, int y, int x, wchar_t *wstr); int winnwstr(WINDOW*win, wchar_t *wstr); int winwstr(WINDOW*win, wchar_t *wstr); int winnwstr(WINDOW*win, wchar_t *wstr, int n);</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>PARAMETERS</b>  | <p><i>wstr</i>        Is a pointer to an object that can hold the retrieved multibyte character string.</p> <p><i>n</i>            Is the number of characters not to exceed when retrieving <i>wstr</i>.</p> <p><i>y</i>            Is the y (row) coordinate of the starting position of the string to be retrieved.</p> <p><i>x</i>            Is the x (column) coordinate of the starting position of the string to be retrieved.</p> <p><i>win</i>         Is a pointer to the window in which the string is to be retrieved.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>DESCRIPTION</b> | <p>The <code>inwstr()</code> and <code>winwstr()</code> functions retrieve a wide character string (without attributes) starting at the current cursor position of the <code>stdscr</code> window and window <i>win</i>, respectively, and ending at the right margin. The <code>mvinwstr()</code> and <code>mvwinwstr()</code> functions retrieve a wide character string located at the position indicated by the <i>x</i> (column) and <i>y</i> (row) parameters (the former in the <code>stdscr</code> window; the latter in window <i>win</i>).</p> <p>The <code>innwstr()</code>, <code>winnwstr()</code>, <code>mvinnwstr()</code>, and <code>mvwinnwstr()</code> functions retrieve at most <i>n</i> characters from the window <code>stdscr</code> and <i>win</i>, respectively. The former two functions retrieve the string starting at the current cursor position; the latter two commands return the string, starting at the position specified by the <i>x</i> and <i>y</i> parameters.</p> <p>All these functions store the retrieved string in the object pointed to by <i>wstr</i>. They only store complete wide characters. If the area pointed to by <i>wstr</i> is not large enough to hold at least one character, these functions fail.</p> |

innwstr(3XCURSES)

Only the character portion of the character/rendition pair is returned. To return the complete character/rendition pair, use `win_wchstr(3XCURSES)`.

**RETURN VALUES** On success, the `inwstr()`, `mvinwstr()`, `mvwinwstr()`, and `winwstr()` functions return OK. Otherwise, they return ERR.

On success, the `innwstr()`, `mvinnwstr()`, `mvwinnwstr()`, and `winnwstr()` functions return the number of characters read into the string. Otherwise, they return ERR.

**ERRORS** None.

**ATTRIBUTES** See `attributes(5)` for descriptions of the following attributes:

| ATTRIBUTE TYPE      | ATTRIBUTE VALUE |
|---------------------|-----------------|
| Interface Stability | Standard        |
| MT-Level            | Unsafe          |

**SEE ALSO** `in_wch(3XCURSES)`, `in_wchnstr(3XCURSES)`, `libcurses(3XCURSES)`, `attributes(5)`, `standards(5)`

**NAME** | insch, wunsch, mvinsch, mvwansch – insert a character

**SYNOPSIS** | `cc [ flag... ] file... -I /usr/xpg4/include -L /usr/xpg4/lib \`  
`-R /usr/xpg4/lib -lcurses [ library... ]`

`c89 [ flag... ] file... -lcurses [ library... ]`

```
#include <curses.h>
int insch(chtype ch);
int mvinsch(int y, int x, chtype ch);
int mvwansch(WINDOW *win, int y, int x, chtype ch);
int wansch(WINDOW *win, chtype ch);
```

**PARAMETERS** | *ch* | Is the character to be inserted.  
*y* | Is the y (row) coordinate of the position of the character.  
*x* | Is the x (column) coordinate of the position of the character.  
*win* | Is a pointer to the window in which the character is to be inserted.

**DESCRIPTION** | These functions insert the character and rendition from *ch* into the current or specified window at the current or specified position.

These functions do not perform wrapping and do not advance the cursor position. These functions perform special-character processing, with the exception that if a newline is inserted into the last line of a window and scrolling is not enabled, the behavior is unspecified.

**RETURN VALUES** | Upon successful completion, these functions return OK. Otherwise, they return ERR.

**ERRORS** | No errors are defined.

**USAGE** | These functions are only guaranteed to operate reliably on character sets in which each character fits into a single byte, whose attributes can be expressed using only constants with the A\_ prefix.

**ATTRIBUTES** | See attributes(5) for descriptions of the following attributes:

| ATTRIBUTE TYPE      | ATTRIBUTE VALUE |
|---------------------|-----------------|
| Interface Stability | Standard        |
| MT-Level            | Unsafe          |

**SEE ALSO** | ins\_wch(3XCURSES), libcurses(3XCURSES), attributes(5), standards(5)

insdelln(3XCURSES)

**NAME** | insdelln, winsdelln – insert/delete lines to/from the window

**SYNOPSIS** | `cc [ flag... ] file... -I /usr/xpg4/include -L /usr/xpg4/lib \`  
`-R /usr/xpg4/lib -lcurses [ library... ]`

**SYNOPSIS** | `c89 [ flag... ] file... -lcurses [ library... ]`

**SYNOPSIS** | `#include <curses.h>`  
`int insdelln(int n);`  
`int winsdelln(WINDOW *win, int n);`

**PARAMETERS** | *n* | Is the number of lines to insert or delete (positive *n* inserts; negative *n* deletes).

**PARAMETERS** | *win* | Is a pointer to the window in which to insert or delete a line.

**DESCRIPTION** | The insdelln() and winsdelln() functions insert or delete blank lines in stdscr or win, respectively. When *n* is positive, *n* lines are added before the current line and the bottom *n* lines are lost; when *n* is negative, *n* lines are deleted starting with the current line, the remaining lines are moved up, and the bottom *n* lines are cleared. The position of the cursor does not change.

**RETURN VALUES** | On success, these functions return OK. Otherwise, they return ERR.

**ERRORS** | None.

**ATTRIBUTES** | See attributes(5) for descriptions of the following attributes:

| ATTRIBUTE TYPE      | ATTRIBUTE VALUE |
|---------------------|-----------------|
| Interface Stability | Standard        |
| MT-Level            | Unsafe          |

**SEE ALSO** | deleteln(3XCURSES), insertln(3XCURSES), libcurses(3XCURSES), attributes(5), standards(5)

**NAME** insertln, winsertln – insert a line in a window

**SYNOPSIS**

```
cc [flag...] file... -I /usr/xpg4/include -L /usr/xpg4/lib \
-R /usr/xpg4/lib -lcurses [library...]

c89 [flag...] file... -lcurses [library...]

#include <curses.h>

int insertln(void);

int winsertln(WINDOW *win);
```

**PARAMETERS** *win* Is a pointer to the window in which to insert the line.

**DESCRIPTION** The insertln() and winsertln() functions insert a blank line before the current line in stdscr or *win*, respectively. The new line becomes the current line. The current line and all lines after it in the window are moved down one line. The bottom line in the window is discarded.

**RETURN VALUES** On success, these functions return OK. Otherwise, they return ERR.

**ERRORS** None.

**ATTRIBUTES** See attributes(5) for descriptions of the following attributes:

| ATTRIBUTE TYPE      | ATTRIBUTE VALUE |
|---------------------|-----------------|
| Interface Stability | Standard        |
| MT-Level            | Unsafe          |

**SEE ALSO** bkgdset(3XCURSES), deleteln(3XCURSES), insdelln(3XCURSES), libcurses(3XCURSES), attributes(5), standards(5)

## insnstr(3XCURSES)

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |            |                                            |          |                                                                                                                                  |          |                                                                          |          |                                                                             |            |                                                                   |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------------------------------------------|----------|----------------------------------------------------------------------------------------------------------------------------------|----------|--------------------------------------------------------------------------|----------|-----------------------------------------------------------------------------|------------|-------------------------------------------------------------------|
| <b>NAME</b>        | <code>insnstr</code> , <code>insstr</code> , <code>mvinsnstr</code> , <code>mvinsstr</code> , <code>mvwinsnstr</code> , <code>mvwinsstr</code> , <code>winsnstr</code> , <code>winsstr</code> – insert a multibyte character string                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |            |                                            |          |                                                                                                                                  |          |                                                                          |          |                                                                             |            |                                                                   |
| <b>SYNOPSIS</b>    | <pre>cc [ flag... ] file... -I /usr/xpg4/include -L /usr/xpg4/lib \ -R /usr/xpg4/lib -lcurses [ library... ]  c89 [ flag... ] file... -lcurses [ library... ]  #include &lt;curses.h&gt;  int insnstr(const char *str, int n); int insstr(const char *str); int mvinsnstr(int y, int x, const char *str, int n); int mvinsstr(int y, int x, const char *str); int mvwinsnstr(WINDOW *win, int y, int x, const char *str, int n); int mvwinsstr(WINDOW *win, int y, int x, const char *str); int winsnstr(WINDOW *win, const char *str, int n); int winsstr(WINDOW *win, const char *str);</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |            |                                            |          |                                                                                                                                  |          |                                                                          |          |                                                                             |            |                                                                   |
| <b>PARAMETERS</b>  | <table><tr><td><i>str</i></td><td>Is a pointer to the string to be inserted.</td></tr><tr><td><i>n</i></td><td>Is the number of characters not to exceed when inserting <i>str</i>. If <i>n</i> is less than 1, the entire string is inserted.</td></tr><tr><td><i>y</i></td><td>Is the <i>y</i> (row) coordinate of the starting position of the string.</td></tr><tr><td><i>x</i></td><td>Is the <i>x</i> (column) coordinate of the starting position of the string.</td></tr><tr><td><i>win</i></td><td>Is a pointer to the window in which the string is to be inserted.</td></tr></table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <i>str</i> | Is a pointer to the string to be inserted. | <i>n</i> | Is the number of characters not to exceed when inserting <i>str</i> . If <i>n</i> is less than 1, the entire string is inserted. | <i>y</i> | Is the <i>y</i> (row) coordinate of the starting position of the string. | <i>x</i> | Is the <i>x</i> (column) coordinate of the starting position of the string. | <i>win</i> | Is a pointer to the window in which the string is to be inserted. |
| <i>str</i>         | Is a pointer to the string to be inserted.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |            |                                            |          |                                                                                                                                  |          |                                                                          |          |                                                                             |            |                                                                   |
| <i>n</i>           | Is the number of characters not to exceed when inserting <i>str</i> . If <i>n</i> is less than 1, the entire string is inserted.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |            |                                            |          |                                                                                                                                  |          |                                                                          |          |                                                                             |            |                                                                   |
| <i>y</i>           | Is the <i>y</i> (row) coordinate of the starting position of the string.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |            |                                            |          |                                                                                                                                  |          |                                                                          |          |                                                                             |            |                                                                   |
| <i>x</i>           | Is the <i>x</i> (column) coordinate of the starting position of the string.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |            |                                            |          |                                                                                                                                  |          |                                                                          |          |                                                                             |            |                                                                   |
| <i>win</i>         | Is a pointer to the window in which the string is to be inserted.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |            |                                            |          |                                                                                                                                  |          |                                                                          |          |                                                                             |            |                                                                   |
| <b>DESCRIPTION</b> | <p>The <code>insstr()</code> function inserts <i>str</i> at the current cursor position of the <code>stdscr</code> window. The <code>winsstr()</code> function performs the identical action, but in window <i>win</i>. The <code>mvinsstr()</code> and <code>mvwinsstr()</code> functions insert the character string at the starting position indicated by the <i>x</i> (column) and <i>y</i> (row) parameters (the former to the <code>stdscr</code> window; the latter to window <i>win</i>).</p> <p>The <code>insnstr()</code>, <code>winsnstr()</code>, <code>mvinsnstr()</code>, and <code>mvwinsnstr()</code> functions insert <i>n</i> characters to the window or as many as will fit on the line. If <i>n</i> is less than 1, the entire string is inserted or as much of it as fits on the line. The former two functions place the string at the current cursor position; the latter two commands use the position specified by the <i>x</i> and <i>y</i> parameters.</p> <p>All characters to the right of inserted characters are moved to the right. Characters that don't fit on the current line are discarded. The cursor is left at the point of insertion.</p> |            |                                            |          |                                                                                                                                  |          |                                                                          |          |                                                                             |            |                                                                   |

insnstr(3XCURSES)

If a character in *str* is a newline, carriage return, backspace, or tab, the cursor is moved appropriately. The cursor is moved to the next tab stop for each tab character (by default, tabs are eight characters apart). If the character is a control character other than those previously mentioned, the character is inserted using  $\hat{x}$  notation, where *x* is a printable character. `clrtoeol(3XCURSES)` is automatically done before a newline.

**RETURN VALUES** On success, these functions return OK. Otherwise, they return ERR.

**ERRORS** None.

**ATTRIBUTES** See `attributes(5)` for descriptions of the following attributes:

| ATTRIBUTE TYPE      | ATTRIBUTE VALUE |
|---------------------|-----------------|
| Interface Stability | Standard        |
| MT-Level            | Unsafe          |

**SEE ALSO** `addchstr(3XCURSES)`, `addstr(3XCURSES)`, `clrtoeol(3XCURSES)`, `ins_nwstr(3XCURSES)`, `insch(3XCURSES)`, `libcurses(3XCURSES)`, `attributes(5)`, `standards(5)`

## ins\_nwstr(3XCURSES)

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |             |                                            |          |                                                                                                                                   |          |                                                                   |          |                                                                      |            |                                                                   |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|--------------------------------------------|----------|-----------------------------------------------------------------------------------------------------------------------------------|----------|-------------------------------------------------------------------|----------|----------------------------------------------------------------------|------------|-------------------------------------------------------------------|
| <b>NAME</b>        | ins_nwstr, ins_wstr, mvins_nwstr, mvins_wstr, mvwins_nwstr, mvwins_wstr, wins_nwstr, wins_wstr – insert a wide character string                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |             |                                            |          |                                                                                                                                   |          |                                                                   |          |                                                                      |            |                                                                   |
| <b>SYNOPSIS</b>    | <pre>cc [ flag... ] file... -I /usr/xpg4/include -L /usr/xpg4/lib \ -R /usr/xpg4/lib -lcurses [ library... ]  c89 [ flag... ] file... -lcurses [ library... ]  #include &lt;curses.h&gt;  int ins_nwstr(const wchar_t *wstr, int n); int ins_wstr(const wchar_t *wstr); int mvins_nwstr(int y, int x, const wchar_t *wstr, int n); int mvins_wstr(int y, int x, const wchar_t *wstr); int mvwins_nwstr(WINDOW *win, int y, int x, const wchar_t *wstr, int n); int mvwins_wstr(WINDOW *win, int y, int x, const wchar_t *wstr); int wins_nwstr(WINDOW *win, const wchar_t *wstr, int n); int wins_wstr(WINDOW *win, const wchar_t *wstr);</pre>                                                                                                                                                                                                                                                                                                                                                       |             |                                            |          |                                                                                                                                   |          |                                                                   |          |                                                                      |            |                                                                   |
| <b>PARAMETERS</b>  | <table><tr><td><i>wstr</i></td><td>Is a pointer to the string to be inserted.</td></tr><tr><td><i>n</i></td><td>Is the number of characters not to exceed when inserting <i>wstr</i>. If <i>n</i> is less than 1, the entire string is inserted.</td></tr><tr><td><i>y</i></td><td>Is the y (row) coordinate of the starting position of the string.</td></tr><tr><td><i>x</i></td><td>Is the x (column) coordinate of the starting position of the string.</td></tr><tr><td><i>win</i></td><td>Is a pointer to the window in which the string is to be inserted.</td></tr></table>                                                                                                                                                                                                                                                                                                                                                                                                                   | <i>wstr</i> | Is a pointer to the string to be inserted. | <i>n</i> | Is the number of characters not to exceed when inserting <i>wstr</i> . If <i>n</i> is less than 1, the entire string is inserted. | <i>y</i> | Is the y (row) coordinate of the starting position of the string. | <i>x</i> | Is the x (column) coordinate of the starting position of the string. | <i>win</i> | Is a pointer to the window in which the string is to be inserted. |
| <i>wstr</i>        | Is a pointer to the string to be inserted.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |             |                                            |          |                                                                                                                                   |          |                                                                   |          |                                                                      |            |                                                                   |
| <i>n</i>           | Is the number of characters not to exceed when inserting <i>wstr</i> . If <i>n</i> is less than 1, the entire string is inserted.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |             |                                            |          |                                                                                                                                   |          |                                                                   |          |                                                                      |            |                                                                   |
| <i>y</i>           | Is the y (row) coordinate of the starting position of the string.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |             |                                            |          |                                                                                                                                   |          |                                                                   |          |                                                                      |            |                                                                   |
| <i>x</i>           | Is the x (column) coordinate of the starting position of the string.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |             |                                            |          |                                                                                                                                   |          |                                                                   |          |                                                                      |            |                                                                   |
| <i>win</i>         | Is a pointer to the window in which the string is to be inserted.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |             |                                            |          |                                                                                                                                   |          |                                                                   |          |                                                                      |            |                                                                   |
| <b>DESCRIPTION</b> | <p>The <code>ins_wstr()</code> function inserts <i>wstr</i> at the current cursor position of the <code>stdscr</code> window. The <code>wins_wstr()</code> function performs the identical action, but in window <i>win</i>. The <code>mvins_wstr()</code> and <code>mvwins_wstr()</code> functions insert <i>wstr</i> string at the starting position indicated by the <i>x</i> (column) and <i>y</i> (row) parameters (the former in the <code>stdscr</code> window; the latter in window <i>win</i>).</p> <p>The <code>ins_nwstr()</code>, <code>wins_nwstr()</code>, <code>mvins_nwstr()</code>, and <code>mvwins_nwstr()</code> functions insert <i>n</i> characters to the window or as many as will fit on the line. If <i>n</i> is less than 1, the entire string is inserted or as much of it as fits on the line. The former two functions place the string at the current cursor position; the latter two commands use the position specified by the <i>x</i> and <i>y</i> parameters.</p> |             |                                            |          |                                                                                                                                   |          |                                                                   |          |                                                                      |            |                                                                   |

ins\_nwstr(3XCURSES)

All characters to the right of inserted characters are moved to the right. Characters that don't fit on the current line are discarded. The cursor is left at the point of insertion.

If a character in *wstr* is a newline, carriage return, backspace, or tab, the cursor is moved appropriately. The cursor is moved to the next tab stop for each tab character (by default, tabs are eight characters apart). If the character is a control character other than those previously mentioned, the character is inserted using  $\hat{x}$  notation, where  $x$  is a printable character. `clrtoeol(3XCURSES)` is automatically done before a newline.

**RETURN VALUES** On success, these functions return OK. Otherwise, they return ERR.

**ERRORS** None.

**ATTRIBUTES** See `attributes(5)` for descriptions of the following attributes:

| ATTRIBUTE TYPE      | ATTRIBUTE VALUE |
|---------------------|-----------------|
| Interface Stability | Standard        |
| MT-Level            | Unsafe          |

**SEE ALSO** `add_wchnstr(3XCURSES)`, `addnwstr(3XCURSES)`, `clrtoeol(3XCURSES)`, `ins_wch(3XCURSES)`, `insnstr(3XCURSES)`, `libcurses(3XCURSES)`, `attributes(5)`, `standards(5)`

## ins\_wch(3XCURSES)

| <b>NAME</b>          | ins_wch, wins_wch, mvins_wch, mvwins_wch – insert a complex character                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                |                                          |                     |                                                             |          |                                                                |            |                                                                      |
|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|------------------------------------------|---------------------|-------------------------------------------------------------|----------|----------------------------------------------------------------|------------|----------------------------------------------------------------------|
| <b>SYNOPSIS</b>      | <pre>cc [ flag... ] file... -I /usr/xpg4/include -L /usr/xpg4/lib \ -R /usr/xpg4/lib -lcurses [ library... ]  c89 [ flag... ] file... -lcurses [ library... ]  #include &lt;curses.h&gt;  int ins_wch(const cchar_t *wch); int mvins_wch(int y, int x, const cchar_t *wch); int mvwins_wch(WINDOW *win, int y, int x, const cchar_t *wch); int wins_wch(WINDOW *win, const cchar_t *wch);</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                |                                          |                     |                                                             |          |                                                                |            |                                                                      |
| <b>PARAMETERS</b>    | <table border="0"> <tr> <td style="padding-right: 20px;"><i>wch</i></td> <td>Is the complex character to be inserted.</td> </tr> <tr> <td><i>y</i></td> <td>Is the y (row) coordinate of the position of the character.</td> </tr> <tr> <td><i>x</i></td> <td>Is the x (column) coordinate of the position of the character.</td> </tr> <tr> <td><i>win</i></td> <td>Is a pointer to the window in which the character is to be inserted.</td> </tr> </table>                                                                                                                                                                                                                                                                                                                                                                                    | <i>wch</i>     | Is the complex character to be inserted. | <i>y</i>            | Is the y (row) coordinate of the position of the character. | <i>x</i> | Is the x (column) coordinate of the position of the character. | <i>win</i> | Is a pointer to the window in which the character is to be inserted. |
| <i>wch</i>           | Is the complex character to be inserted.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                |                                          |                     |                                                             |          |                                                                |            |                                                                      |
| <i>y</i>             | Is the y (row) coordinate of the position of the character.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                |                                          |                     |                                                             |          |                                                                |            |                                                                      |
| <i>x</i>             | Is the x (column) coordinate of the position of the character.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                |                                          |                     |                                                             |          |                                                                |            |                                                                      |
| <i>win</i>           | Is a pointer to the window in which the character is to be inserted.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                |                                          |                     |                                                             |          |                                                                |            |                                                                      |
| <b>DESCRIPTION</b>   | <p>The <code>ins_wch()</code> function inserts the complex character <i>wch</i> at the current cursor position of the <code>stdscr</code> window. The <code>wins_wch()</code> function performs the identical action but in window <i>win</i>. The <code>mvins_wch()</code> and <code>mvwins_wch()</code> functions insert the character at the position indicated by the <i>x</i> (column) and <i>y</i> (row) parameters (the former in the <code>stdscr</code> window; the latter in window <i>win</i>). The cursor position does not change.</p> <p>All characters to the right of the inserted character are moved right one character. The last character on the line is deleted.</p> <p>Insertions and deletions occur at the character level. The cursor is adjusted to the first column of the character prior to the the operation.</p> |                |                                          |                     |                                                             |          |                                                                |            |                                                                      |
| <b>RETURN VALUES</b> | On success, these functions return OK. Otherwise, they return ERR.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                |                                          |                     |                                                             |          |                                                                |            |                                                                      |
| <b>ERRORS</b>        | None.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                |                                          |                     |                                                             |          |                                                                |            |                                                                      |
| <b>ATTRIBUTES</b>    | See <code>attributes(5)</code> for descriptions of the following attributes:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                |                                          |                     |                                                             |          |                                                                |            |                                                                      |
|                      | <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">ATTRIBUTE TYPE</th> <th style="text-align: center;">ATTRIBUTE VALUE</th> </tr> </thead> <tbody> <tr> <td>Interface Stability</td> <td>Standard</td> </tr> <tr> <td>MT-Level</td> <td>Unsafe</td> </tr> </tbody> </table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | ATTRIBUTE TYPE | ATTRIBUTE VALUE                          | Interface Stability | Standard                                                    | MT-Level | Unsafe                                                         |            |                                                                      |
| ATTRIBUTE TYPE       | ATTRIBUTE VALUE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                |                                          |                     |                                                             |          |                                                                |            |                                                                      |
| Interface Stability  | Standard                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                |                                          |                     |                                                             |          |                                                                |            |                                                                      |
| MT-Level             | Unsafe                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                |                                          |                     |                                                             |          |                                                                |            |                                                                      |

ins\_wch(3XCURSES)

**SEE ALSO** add\_wch(3XCURSES), ins\_nwstr(3XCURSES), libcurses(3XCURSES),  
attributes(5), standards(5)

## intrflush(3XCURSES)

**NAME** | intrflush – enable or disable flush on interrupt

**SYNOPSIS** | `cc [ flag... ] file... -I /usr/xpg4/include -L /usr/xpg4/lib \`  
| `-R /usr/xpg4/lib -lcurses [ library... ]`

| `c89 [ flag... ] file... -lcurses [ library... ]`

| `#include <curses.h>`

| `int intrflush(WINDOW *win, bool bf);`

**PARAMETERS** | *win* | Is ignored.

| *bf* | Is a Boolean expression.

**DESCRIPTION** | The `intrflush()` function specifies whether pressing an interrupt key (interrupt, suspend, or quit) will flush the input buffer associated with the current screen. If the value of *bf* is TRUE, then flushing of the output buffer associated with the current screen will occur when an interrupt key (interrupt, suspend, or quit) is pressed. If the value of *bf* is FALSE, then no flushing of the buffer will occur when an interrupt key is pressed. The default for the option is inherited from the display driver settings. The *win* argument is ignored.

**RETURN VALUES** | Upon successful completion, `intrflush()` returns OK. Otherwise, it returns ERR.

**ERRORS** | No errors are defined.

**ATTRIBUTES** | See `attributes(5)` for descriptions of the following attributes:

| ATTRIBUTE TYPE      | ATTRIBUTE VALUE |
|---------------------|-----------------|
| Interface Stability | Standard        |
| MT-Level            | Unsafe          |

**SEE ALSO** | `flushinp(3XCURSES)`, `libcurses(3XCURSES)`, `qiflush(3XCURSES)`, `attributes(5)`, `standards(5)`

**NAME** in\_wch, mvin\_wch, mvwin\_wch, win\_wch – retrieve a complex character (with rendition)

**SYNOPSIS**

```
cc [flag...] file... -I /usr/xpg4/include -L /usr/xpg4/lib \
-R /usr/xpg4/lib -lcurses [library...]

c89 [flag...] file... -lcurses [library...]

#include <curses.h>

int in_wch(cchar_t *wcv);

int mvin_wch(int y, int x, cchar_t *wcv);

int mvwin_wch(WINDOW *win, int y, cchar_t *wcv);

int win_wch(WINDOW *win, cchar_t *wcv);
```

**DESCRIPTION** The in\_wch() and win\_wch() functions retrieve the complex character and its rendition located at the current cursor position of the stdscr window and window win, respectively. The mvin\_wch() and mvwin\_wch() functions retrieve the complex character and its rendition located at the position indicated by the x (column) and y (row) parameters (the former in the stdscr window; the latter in window win).

All these functions store the retrieved character and its rendition in the object pointed to by wcv.

**PARAMETERS**

|     |                                                                                 |
|-----|---------------------------------------------------------------------------------|
| wcv | Is a pointer to an object that can store a complex character and its rendition. |
| y   | Is the y (row) coordinate of the position of the character to be returned.      |
| x   | Is the x (column) coordinate of the position of the character to be returned.   |
| win | Is a pointer to the window that contains the character to be returned.          |

**RETURN VALUES** On success, these functions return OK. Otherwise, they return ERR.

**ERRORS** None.

**ATTRIBUTES** See attributes(5) for descriptions of the following attributes:

| ATTRIBUTE TYPE      | ATTRIBUTE VALUE |
|---------------------|-----------------|
| Interface Stability | Standard        |
| MT-Level            | Unsafe          |

**SEE ALSO** add\_wch(3XCURSES), inch(3XCURSES), libcurses(3XCURSES), attributes(5), standards(5)

## in\_wchnstr(3XCURSES)

|                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                     |                                                                                       |                |                                                                                 |                |                                                                                                |                |                                                                                                   |                  |                                                                    |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|---------------------------------------------------------------------------------------|----------------|---------------------------------------------------------------------------------|----------------|------------------------------------------------------------------------------------------------|----------------|---------------------------------------------------------------------------------------------------|------------------|--------------------------------------------------------------------|
| <b>NAME</b>         | <code>in_wchnstr</code> , <code>in_wchstr</code> , <code>mvin_wchnstr</code> , <code>mvin_wchstr</code> , <code>mvwin_wchnstr</code> , <code>mvwin_wchstr</code> , <code>win_wchnstr</code> , <code>win_wchstr</code> – retrieve complex character string (with rendition)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                     |                                                                                       |                |                                                                                 |                |                                                                                                |                |                                                                                                   |                  |                                                                    |
| <b>SYNOPSIS</b>     | <pre>cc [ flag... ] file... -I /usr/xpg4/include -L /usr/xpg4/lib \ -R /usr/xpg4/lib -lcurses [ library... ]  c89 [ flag... ] file... -lcurses [ library... ]  #include &lt;curses.h&gt;  int in_wchnstr(cchar_t *wchstr, int n); int in_wchstr(cchar_t *wchstr); int mvin_wchnstr(int y, int x, cchar_t *wchstr, int n); int mvin_wchstr(int y, int x, cchar_t *wchstr); int mvwin_wchnstr(WINDOW *win, int y, int x, cchar_t *wchstr, int n); int mvwin_wchstr(WINDOW *win, int y, int x, cchar_t *wchstr); int win_wchnstr(WINDOW *win, cchar_t *wchstr, int n); int win_wchstr(WINDOW *win, cchar_t *wchstr);</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                     |                                                                                       |                |                                                                                 |                |                                                                                                |                |                                                                                                   |                  |                                                                    |
| <b>DESCRIPTION</b>  | <p>The <code>in_wchstr()</code> and <code>win_wchstr()</code> functions retrieve a complex character string (with rendition) starting at the current cursor position of the <code>stdscr</code> window and window <code>win</code>, respectively, and ending at the right margin. The <code>mvin_wchstr()</code> and <code>mvwin_wchstr()</code> functions retrieve a complex character string located at the position indicated by the <code>x</code> (column) and <code>y</code> (row) parameters (the former in the <code>stdscr</code> window; the latter in window <code>win</code>).</p> <p>The <code>in_wchnstr()</code>, <code>win_wchnstr()</code>, <code>mvin_wchnstr()</code>, and <code>mvwin_wchnstr()</code> functions retrieve at most <code>n</code> characters from the window <code>stdscr</code> and <code>win</code>, respectively. The former two functions retrieve the string, starting at the current cursor position; the latter two commands retrieve the string, starting at the position specified by the <code>x</code> and <code>y</code> parameters.</p> <p>The retrieved character string (with renditions) is stored in the object pointed to by <code>wcval</code>.</p> |                     |                                                                                       |                |                                                                                 |                |                                                                                                |                |                                                                                                   |                  |                                                                    |
| <b>PARAMETERS</b>   | <table><tr><td><code>wchstr</code></td><td>Is a pointer to an object where the retrieved complex character string can be stored.</td></tr><tr><td><code>n</code></td><td>Is the number of characters not to exceed when retrieving <code>wchstr</code>.</td></tr><tr><td><code>y</code></td><td>Is the <code>y</code> (row) coordinate of the starting position of the string to be retrieved.</td></tr><tr><td><code>x</code></td><td>Is the <code>x</code> (column) coordinate of the starting position of the string to be retrieved.</td></tr><tr><td><code>win</code></td><td>Is a pointer to the window in which the string is to be retrieved.</td></tr></table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <code>wchstr</code> | Is a pointer to an object where the retrieved complex character string can be stored. | <code>n</code> | Is the number of characters not to exceed when retrieving <code>wchstr</code> . | <code>y</code> | Is the <code>y</code> (row) coordinate of the starting position of the string to be retrieved. | <code>x</code> | Is the <code>x</code> (column) coordinate of the starting position of the string to be retrieved. | <code>win</code> | Is a pointer to the window in which the string is to be retrieved. |
| <code>wchstr</code> | Is a pointer to an object where the retrieved complex character string can be stored.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                     |                                                                                       |                |                                                                                 |                |                                                                                                |                |                                                                                                   |                  |                                                                    |
| <code>n</code>      | Is the number of characters not to exceed when retrieving <code>wchstr</code> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                     |                                                                                       |                |                                                                                 |                |                                                                                                |                |                                                                                                   |                  |                                                                    |
| <code>y</code>      | Is the <code>y</code> (row) coordinate of the starting position of the string to be retrieved.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                     |                                                                                       |                |                                                                                 |                |                                                                                                |                |                                                                                                   |                  |                                                                    |
| <code>x</code>      | Is the <code>x</code> (column) coordinate of the starting position of the string to be retrieved.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                     |                                                                                       |                |                                                                                 |                |                                                                                                |                |                                                                                                   |                  |                                                                    |
| <code>win</code>    | Is a pointer to the window in which the string is to be retrieved.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                     |                                                                                       |                |                                                                                 |                |                                                                                                |                |                                                                                                   |                  |                                                                    |

in\_wchnstr(3XCURSES)

**RETURN VALUES** On success, these functions return OK. Otherwise, they return ERR.

**ERRORS** None.

**ATTRIBUTES** See `attributes(5)` for descriptions of the following attributes:

| ATTRIBUTE TYPE      | ATTRIBUTE VALUE |
|---------------------|-----------------|
| Interface Stability | Standard        |
| MT-Level            | Unsafe          |

**SEE ALSO** `in_wch(3XCURSES)`, `libcurses(3XCURSES)`, `attributes(5)`, `standards(5)`

## is\_linetouched(3XCURSES)

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |            |                                                                                   |             |                                                     |              |                                                                                  |              |                                                          |          |                                                                                                 |          |                                                          |                |                                                                                 |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----------------------------------------------------------------------------------|-------------|-----------------------------------------------------|--------------|----------------------------------------------------------------------------------|--------------|----------------------------------------------------------|----------|-------------------------------------------------------------------------------------------------|----------|----------------------------------------------------------|----------------|---------------------------------------------------------------------------------|
| <b>NAME</b>        | is_linetouched, is_wintouched, touchline, touchwin, untouchwin, wtouchln – control window refresh                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |            |                                                                                   |             |                                                     |              |                                                                                  |              |                                                          |          |                                                                                                 |          |                                                          |                |                                                                                 |
| <b>SYNOPSIS</b>    | <pre>cc [ flag... ] file... -I /usr/xpg4/include -L /usr/xpg4/lib \ -R /usr/xpg4/lib -lcurses [ library... ]  c89 [ flag... ] file... -lcurses [ library... ]  #include &lt;curses.h&gt;  bool is_linetouched(WINDOW *win, int line);  bool is_wintouched(WINDOW *win);  int touchline(WINDOW *win, int start, int count);  int touchwin(WINDOW *win);  int untouchwin(WINDOW *win);  int wtouchln(WINDOW *win, int y, int n, int changed);</pre>                                                                                                                                                                                                                                                                                                                                                                                                                    |            |                                                                                   |             |                                                     |              |                                                                                  |              |                                                          |          |                                                                                                 |          |                                                          |                |                                                                                 |
| <b>PARAMETERS</b>  | <table><tr><td><i>win</i></td><td>Is a pointer to the window in which the refresh is to be controlled or monitored.</td></tr><tr><td><i>line</i></td><td>Is the line to be checked for change since refresh.</td></tr><tr><td><i>start</i></td><td>Is the starting line number of the portion of the window to make appear changed.</td></tr><tr><td><i>count</i></td><td>Is the number of lines in the window to mark as changed.</td></tr><tr><td><i>y</i></td><td>Is the starting line number of the portion of the window to make appear changed or not changed.</td></tr><tr><td><i>n</i></td><td>Is the number of lines in the window to mark as changed.</td></tr><tr><td><i>changed</i></td><td>Is a flag indicating whether to make lines look changed (0) or not changed (1).</td></tr></table>                                                            | <i>win</i> | Is a pointer to the window in which the refresh is to be controlled or monitored. | <i>line</i> | Is the line to be checked for change since refresh. | <i>start</i> | Is the starting line number of the portion of the window to make appear changed. | <i>count</i> | Is the number of lines in the window to mark as changed. | <i>y</i> | Is the starting line number of the portion of the window to make appear changed or not changed. | <i>n</i> | Is the number of lines in the window to mark as changed. | <i>changed</i> | Is a flag indicating whether to make lines look changed (0) or not changed (1). |
| <i>win</i>         | Is a pointer to the window in which the refresh is to be controlled or monitored.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |            |                                                                                   |             |                                                     |              |                                                                                  |              |                                                          |          |                                                                                                 |          |                                                          |                |                                                                                 |
| <i>line</i>        | Is the line to be checked for change since refresh.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |            |                                                                                   |             |                                                     |              |                                                                                  |              |                                                          |          |                                                                                                 |          |                                                          |                |                                                                                 |
| <i>start</i>       | Is the starting line number of the portion of the window to make appear changed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |            |                                                                                   |             |                                                     |              |                                                                                  |              |                                                          |          |                                                                                                 |          |                                                          |                |                                                                                 |
| <i>count</i>       | Is the number of lines in the window to mark as changed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |            |                                                                                   |             |                                                     |              |                                                                                  |              |                                                          |          |                                                                                                 |          |                                                          |                |                                                                                 |
| <i>y</i>           | Is the starting line number of the portion of the window to make appear changed or not changed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |            |                                                                                   |             |                                                     |              |                                                                                  |              |                                                          |          |                                                                                                 |          |                                                          |                |                                                                                 |
| <i>n</i>           | Is the number of lines in the window to mark as changed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |            |                                                                                   |             |                                                     |              |                                                                                  |              |                                                          |          |                                                                                                 |          |                                                          |                |                                                                                 |
| <i>changed</i>     | Is a flag indicating whether to make lines look changed (0) or not changed (1).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |            |                                                                                   |             |                                                     |              |                                                                                  |              |                                                          |          |                                                                                                 |          |                                                          |                |                                                                                 |
| <b>DESCRIPTION</b> | <p>The <code>touchwin()</code> function marks the entire window as dirty. This makes it appear to X/Open Curses as if the whole window has been changed, thus causing the entire window to be rewritten with the next call to <code>refresh(3XCURSES)</code>. This is sometimes necessary when using overlapping windows; the change to one window will not be reflected in the other and, hence will not be recorded.</p> <p>The <code>touchline()</code> function marks as dirty a portion of the window starting at line <i>start</i> and continuing for <i>count</i> lines instead of the entire window. Consequently, that portion of the window is updated with the next call to <code>refresh()</code>.</p> <p>The <code>untouchwin()</code> function marks all lines in the window as unchanged since the last refresh, ensuring that it is not updated.</p> |            |                                                                                   |             |                                                     |              |                                                                                  |              |                                                          |          |                                                                                                 |          |                                                          |                |                                                                                 |

is\_linetouched(3XCURSES)

The `wtouchln()` function marks *n* lines starting at line *y* as either changed (*changed=1*) or unchanged (*changed=0*) since the last refresh.

To find out which lines or windows have been changed since the last refresh, use the `is_linetouched()` and `is_wintouched()` functions, respectively. These return `TRUE` if the specified line or window have been changed since the last call to `refresh()` or `FALSE` if no changes have been made.

**RETURN VALUES** On success, these functions return `OK`. Otherwise, they return `ERR`.

**ERRORS** None.

**ATTRIBUTES** See `attributes(5)` for descriptions of the following attributes:

| ATTRIBUTE TYPE      | ATTRIBUTE VALUE |
|---------------------|-----------------|
| Interface Stability | Standard        |
| MT-Level            | Unsafe          |

**SEE ALSO** `doupdate(3XCURSES)`, `libcurses(3XCURSES)`, `attributes(5)`, `standards(5)`

## keyname(3XCURSES)

| <b>NAME</b>                                                                       | keyname, key_name – return character string used as key name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |       |                    |                   |                    |                   |    |                                               |     |                                                                                   |          |                   |             |
|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|--------------------|-------------------|--------------------|-------------------|----|-----------------------------------------------|-----|-----------------------------------------------------------------------------------|----------|-------------------|-------------|
| <b>SYNOPSIS</b>                                                                   | <pre>cc [ flag... ] file... -I /usr/xpg4/include -L /usr/xpg4/lib \ -R /usr/xpg4/lib -lcurses [ library... ]  c89 [ flag... ] file... -lcurses [ library... ]  #include &lt;curses.h&gt;  char *keyname(int c);  char *key_name(wchar_t wc);</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |       |                    |                   |                    |                   |    |                                               |     |                                                                                   |          |                   |             |
| <b>PARAMETERS</b>                                                                 | <p><i>c</i> Is an 8 bit-character or a key code.</p> <p><i>wc</i> Is a wide character key name.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |       |                    |                   |                    |                   |    |                                               |     |                                                                                   |          |                   |             |
| <b>DESCRIPTION</b>                                                                | <p>The <code>keyname()</code> function returns a string pointer to the key name. Make a duplicate copy of the returned string if you plan to modify it.</p> <p>The <code>key_name()</code> function is similar except that it accepts a wide character key name.</p> <p>The following table shows the format of the key name based on the input.</p> <table border="1" data-bbox="444 953 1412 1283"> <thead> <tr> <th>Input</th> <th>Format of Key Name</th> </tr> </thead> <tbody> <tr> <td>Visible character</td> <td>The same character</td> </tr> <tr> <td>Control character</td> <td>^X</td> </tr> <tr> <td>Meta-character (<code>keyname()</code> only)</td> <td>M-X</td> </tr> <tr> <td>Key value defined in <code>&lt;curses.h&gt;</code> (<code>keyname()</code> only)</td> <td>KEY_name</td> </tr> <tr> <td>None of the above</td> <td>UNKNOWN KEY</td> </tr> </tbody> </table> <p>In the preceding table, <i>X</i> can be either a visible character with the high bit cleared or a control character.</p> | Input | Format of Key Name | Visible character | The same character | Control character | ^X | Meta-character ( <code>keyname()</code> only) | M-X | Key value defined in <code>&lt;curses.h&gt;</code> ( <code>keyname()</code> only) | KEY_name | None of the above | UNKNOWN KEY |
| Input                                                                             | Format of Key Name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |       |                    |                   |                    |                   |    |                                               |     |                                                                                   |          |                   |             |
| Visible character                                                                 | The same character                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |       |                    |                   |                    |                   |    |                                               |     |                                                                                   |          |                   |             |
| Control character                                                                 | ^X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |       |                    |                   |                    |                   |    |                                               |     |                                                                                   |          |                   |             |
| Meta-character ( <code>keyname()</code> only)                                     | M-X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |       |                    |                   |                    |                   |    |                                               |     |                                                                                   |          |                   |             |
| Key value defined in <code>&lt;curses.h&gt;</code> ( <code>keyname()</code> only) | KEY_name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |       |                    |                   |                    |                   |    |                                               |     |                                                                                   |          |                   |             |
| None of the above                                                                 | UNKNOWN KEY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |       |                    |                   |                    |                   |    |                                               |     |                                                                                   |          |                   |             |
| <b>RETURN VALUES</b>                                                              | On success, these functions return a pointer to the string used as the key's name. Otherwise, they return a null pointer.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |       |                    |                   |                    |                   |    |                                               |     |                                                                                   |          |                   |             |
| <b>ERRORS</b>                                                                     | None.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |       |                    |                   |                    |                   |    |                                               |     |                                                                                   |          |                   |             |
| <b>ATTRIBUTES</b>                                                                 | See <code>attributes(5)</code> for descriptions of the following attributes:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |       |                    |                   |                    |                   |    |                                               |     |                                                                                   |          |                   |             |

| ATTRIBUTE TYPE      | ATTRIBUTE VALUE |
|---------------------|-----------------|
| Interface Stability | Standard        |

keyname(3XCURSES)

| ATTRIBUTE TYPE | ATTRIBUTE VALUE |
|----------------|-----------------|
| MT-Level       | Unsafe          |

**SEE ALSO** libcurses(3XCURSES), meta(3XCURSES), attributes(5), standards(5)

## keypad(3XCURSES)

|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>NAME</b>              | keypad – enable/disable keypad handling                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>SYNOPSIS</b>          | <pre>cc [ flag... ] file... -I /usr/xpg4/include -L /usr/xpg4/lib \ -R /usr/xpg4/lib -lcurses [ library... ]  c89 [ flag... ] file... -lcurses [ library... ]  #include &lt;curses.h&gt;  int keypad(WINDOW *win, bool bf);</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>PARAMETERS</b>        | <p><i>win</i> Is a pointer to the window in which to enable/disable keypad handling.</p> <p><i>bf</i> Is a Boolean expression.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>DESCRIPTION</b>       | <p>The keypad() function controls keypad translation. If <i>bf</i> is TRUE, keypad translation is enabled. If <i>bf</i> is FALSE, keypad translation is disabled. The initial state is FALSE.</p> <p>This function affects the behavior of any function that provides keyboard input.</p> <p>If the terminal in use requires a command to enable it to transmit distinctive codes when a function key is pressed, then after keypad translation is first enabled, the implementation transmits this command to the terminal before an affected input function tries to read any characters from that terminal.</p> <p>The Curses input model provides the following ways to obtain input from the keyboard:</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Keypad processing</b> | <p>The application can enable or disable keypad translation by calling keypad(). When translation is enabled, Curses attempts to translate a sequence of terminal input that represents the pressing of a function into a single key code. When translation is disabled, Curses passes terminal input to the application without such translation, and any interpretation of the input as representing the pressing of a keypad key must be done by the application.</p> <p>The complete set of key codes for keypad keys that Curses can process is specified by the constants defined in &lt;curses.h&gt; whose names begin with "KEY_". Each terminal type described in the terminfo database may support some or all of these key codes. The terminfo database specifies the sequence of input characters from the terminal type that correspond to each key code.</p> <p>The Curses implementation cannot translate keypad keys on terminals where pressing the keys does not transmit a unique sequence.</p> <p>When translation is enabled and a character that could be the beginning of a function key (such as escape) is received, Curses notes the time and begins accumulating characters. If Curses receives additional characters that represent the processing of a keypad key within an unspecified interval from the time the character was received, then Curses converts this input to a key code for presentation to the application. If such characters are not received during this interval, translation of this input does not</p> |

occur and the individual characters are presented to the application separately. (Because Curses waits for this interval to accumulate a key code, many terminals experience a delay between the time a user presses the escape key and the time the escape key is returned to the application.)

In addition, No Timeout Mode provides that in any case where Curses has received part of a function key sequence, it waits indefinitely for the complete key sequence. The “unspecified interval” in the previous paragraph becomes infinite in No Timeout Mode. No Timeout Mode allows the use of function keys over slow communication lines. No Timeout Mode lets the user type the individual characters of a function key sequence, but also delays application response when the user types a character (not a function key) that begins a function key sequence. For this reason, in No Timeout Mode many terminals will appear to hang between the time a user presses the escape key and the time another key is pressed. No Timeout Mode is switchable by calling `notimeout(3XCURSES)`.

If any special characters (<backspace>, <carriage return>, <newline>, <tab>) are defined or redefined to be characters that are members of a function key sequence, then Curses will be unable to recognize and translate those function keys.

Several of the modes discussed below are described in terms of availability of input. If keypad translation is enabled, then input is not available once Curses has begun receiving a keypad sequence until the sequence is completely received or the interval has elapsed.

### Input Mode

The following four mutually-specific Curses modes let the application control the effect of flow-control characters, the interrupt character, the erase character, and the kill character:

| Input Mode               | Effect                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Cooked Mode              | This achieves normal line-at-a-time processing with all special characters handled outside the application. This achieves the same effect as canonical-mode input processing. The state of the <code>ISIG</code> and <code>IXON</code> flags are not changed upon entering this mode by calling <code>nocbreak(3XCURSES)</code> , and are set upon entering this mode by calling <code>noraw(3XCURSES)</code> .<br><br>Erase and kill characters are supported from any supported locale, no matter the width of the character.                                               |
| <code>cbreak</code> Mode | Characters typed by the user are immediately available to the application and Curses does not perform special processing on either the erase character or the kill character. An application can set <code>cbreak</code> mode to do its own line editing but to let the abort character be used to abort the task. This mode achieves the same effect as non-canonical-mode, Case B input processing (with <code>MIN</code> set to 1 and <code>ICRNL</code> cleared.) The state of the <code>ISIG</code> and <code>IXON</code> flags are not changed upon entering this mode. |

## keypad(3XCURSES)

| Input Mode      | Effect                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Half-Delay Mode | The effect is the same as <code>cbreak</code> , except that input functions wait until a character is available or an interval defined by the application elapses, whichever comes first. This mode achieves the same effect as non-canonical-mode, Case C input processing (with <code>TIME</code> set to the value specified by the application.) The state of the <code>ISIG</code> and <code>IXON</code> flags are not changed upon entering this mode. |
| Raw Mode        | Raw mode gives the application maximum control over terminal input. The application sees each character as it is typed. This achieves the same effect as non-canonical mode, Case D input processing. The <code>ISIG</code> and <code>IXON</code> flags are cleared upon entering this mode.                                                                                                                                                                |

The terminal interface settings are reported when the process calls `initscr(3XCURSES)` or `newterm(3XCURSES)` to initialize Curses and restores these settings when `endwin(3XCURSES)` is called. The initial input mode for Curses operations is especially unless Enhanced Curses compliance, in which the initial mode is `cbreak` mode, is supported.

The behavior of the `BREAK` key depends on other bits in the display driver that are not set by Curses.

**Delay Mode** Two mutually-exclusive delay modes specify how quickly certain Curses functions return to the application when there is no terminal input waiting when the function is called:

|          |                                                                                                                                                                                                                                                                            |
|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| No Delay | The function fails.                                                                                                                                                                                                                                                        |
| Delay    | The application waits until text is passed through to the application. If <code>cbreak</code> or Raw Mode is set, this is after one character. Otherwise, this is after the first <code>&lt;newline&gt;</code> character, end-of-line character, or end-of-file character. |

The effect of No Delay Mode on function key processing is unspecified.

**Echo processing** Echo mode determines whether Curses echoes typed characters to the screen. The effect of Echo mode is analogous to the effect of the `ECHO` flag in the local mode field of the `termios` structure associated with the terminal device connected to the window. However, Curses always clears the `ECHO` flag when invoked, to inhibit the operating system from performing echoing. The method of echoing characters is not identical to the operating system's method of echoing characters, because Curses performs additional processing of terminal input.

If in Echo mode, Curses performs 's's own echoing. Any visible input character is stored in the current or specified window by the input function that the application called, at that window's cursor position, as though `addch(3XCURSES)` were called, with all consequent effects such as cursor movement and wrapping.

keypad(3XCURSES)

If not in Echo mode, any echoing of input must be performed by the application. Applications often perform their own echoing in a controlled area of the screen, or do not echo at all, so they disable Echo mode.

It may not be possible to turn off echo processing for synchronous and networked asynchronous terminals because echo processing is done directly by the terminals. Applications running on such terminals should be aware that any characters typed will appear on the screen at wherever the cursor is positioned.

**RETURN VALUES** Upon successful completion, the keypad() function returns OK. Otherwise, it returns ERR.

**ERRORS** No errors are defined.

**ATTRIBUTES** See attributes(5) for descriptions of the following attributes:

| ATTRIBUTE TYPE      | ATTRIBUTE VALUE |
|---------------------|-----------------|
| Interface Stability | Standard        |
| MT-Level            | Unsafe          |

**SEE ALSO** addch(3XCURSES), endwin(3XCURSES), getch(3XCURSES), initscr(3XCURSES), libcurses(3XCURSES), newterm(3XCURSES), nocbreak(3XCURSES), noraw(3XCURSES), attributes(5), standards(5)

## libcurses(3XCURSES)

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |            |             |      |       |             |         |             |            |       |           |          |         |          |        |         |          |          |         |          |         |        |         |          |      |      |         |        |           |        |            |     |         |                  |        |       |       |         |          |          |               |           |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|------------|-------------|------|-------|-------------|---------|-------------|------------|-------|-----------|----------|---------|----------|--------|---------|----------|----------|---------|----------|---------|--------|---------|----------|------|------|---------|--------|-----------|--------|------------|-----|---------|------------------|--------|-------|-------|---------|----------|----------|---------------|-----------|
| <b>NAME</b>        | libcurses – X/Open Curses library                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |        |            |             |      |       |             |         |             |            |       |           |          |         |          |        |         |          |          |         |          |         |        |         |          |      |      |         |        |           |        |            |     |         |                  |        |       |       |         |          |          |               |           |
| <b>SYNOPSIS</b>    | <pre>cc [ flag... ] file... -I /usr/xpg4/include -L /usr/xpg4/lib \ -R /usr/xpg4/lib -lcurses [ library... ]  c89 [ flag... ] file... -lcurses [ library... ]  #include &lt;curses.h&gt;</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |        |            |             |      |       |             |         |             |            |       |           |          |         |          |        |         |          |          |         |          |         |        |         |          |      |      |         |        |           |        |            |     |         |                  |        |       |       |         |          |          |               |           |
| <b>DESCRIPTION</b> | Functions in this library provide a terminal-independent method of updating character screens with reasonable optimization, conforming to X/Open Curses, Issue 4, Version 2.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |        |            |             |      |       |             |         |             |            |       |           |          |         |          |        |         |          |          |         |          |         |        |         |          |      |      |         |        |           |        |            |     |         |                  |        |       |       |         |          |          |               |           |
| <b>INTERFACES</b>  | The shared object <code>libcurses.so.2</code> provides the public interfaces defined below. See <code>intro(3)</code> for additional information on shared object interfaces.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |        |            |             |      |       |             |         |             |            |       |           |          |         |          |        |         |          |          |         |          |         |        |         |          |      |      |         |        |           |        |            |     |         |                  |        |       |       |         |          |          |               |           |
|                    | <table><tr><td>COLORS</td><td>COLOR_PAIR</td></tr><tr><td>COLOR_PAIRS</td><td>COLS</td></tr><tr><td>LINES</td><td>PAIR_NUMBER</td></tr><tr><td>add_wch</td><td>add_wchnstr</td></tr><tr><td>add_wchstr</td><td>addch</td></tr><tr><td>addchnstr</td><td>addchstr</td></tr><tr><td>addnstr</td><td>addnwstr</td></tr><tr><td>addstr</td><td>addwstr</td></tr><tr><td>attr_get</td><td>attr_off</td></tr><tr><td>attr_on</td><td>attr_set</td></tr><tr><td>attroff</td><td>attron</td></tr><tr><td>attrset</td><td>baudrate</td></tr><tr><td>beep</td><td>bkgd</td></tr><tr><td>bkgdset</td><td>bkgdnd</td></tr><tr><td>bkgdndset</td><td>border</td></tr><tr><td>border_set</td><td>box</td></tr><tr><td>box_set</td><td>can_change_color</td></tr><tr><td>cbreak</td><td>chgat</td></tr><tr><td>clear</td><td>clearok</td></tr><tr><td>clrtoBOT</td><td>clrtoeol</td></tr><tr><td>color_content</td><td>color_set</td></tr></table> | COLORS | COLOR_PAIR | COLOR_PAIRS | COLS | LINES | PAIR_NUMBER | add_wch | add_wchnstr | add_wchstr | addch | addchnstr | addchstr | addnstr | addnwstr | addstr | addwstr | attr_get | attr_off | attr_on | attr_set | attroff | attron | attrset | baudrate | beep | bkgd | bkgdset | bkgdnd | bkgdndset | border | border_set | box | box_set | can_change_color | cbreak | chgat | clear | clearok | clrtoBOT | clrtoeol | color_content | color_set |
| COLORS             | COLOR_PAIR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |        |            |             |      |       |             |         |             |            |       |           |          |         |          |        |         |          |          |         |          |         |        |         |          |      |      |         |        |           |        |            |     |         |                  |        |       |       |         |          |          |               |           |
| COLOR_PAIRS        | COLS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |        |            |             |      |       |             |         |             |            |       |           |          |         |          |        |         |          |          |         |          |         |        |         |          |      |      |         |        |           |        |            |     |         |                  |        |       |       |         |          |          |               |           |
| LINES              | PAIR_NUMBER                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |        |            |             |      |       |             |         |             |            |       |           |          |         |          |        |         |          |          |         |          |         |        |         |          |      |      |         |        |           |        |            |     |         |                  |        |       |       |         |          |          |               |           |
| add_wch            | add_wchnstr                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |        |            |             |      |       |             |         |             |            |       |           |          |         |          |        |         |          |          |         |          |         |        |         |          |      |      |         |        |           |        |            |     |         |                  |        |       |       |         |          |          |               |           |
| add_wchstr         | addch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |        |            |             |      |       |             |         |             |            |       |           |          |         |          |        |         |          |          |         |          |         |        |         |          |      |      |         |        |           |        |            |     |         |                  |        |       |       |         |          |          |               |           |
| addchnstr          | addchstr                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |        |            |             |      |       |             |         |             |            |       |           |          |         |          |        |         |          |          |         |          |         |        |         |          |      |      |         |        |           |        |            |     |         |                  |        |       |       |         |          |          |               |           |
| addnstr            | addnwstr                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |        |            |             |      |       |             |         |             |            |       |           |          |         |          |        |         |          |          |         |          |         |        |         |          |      |      |         |        |           |        |            |     |         |                  |        |       |       |         |          |          |               |           |
| addstr             | addwstr                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |        |            |             |      |       |             |         |             |            |       |           |          |         |          |        |         |          |          |         |          |         |        |         |          |      |      |         |        |           |        |            |     |         |                  |        |       |       |         |          |          |               |           |
| attr_get           | attr_off                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |        |            |             |      |       |             |         |             |            |       |           |          |         |          |        |         |          |          |         |          |         |        |         |          |      |      |         |        |           |        |            |     |         |                  |        |       |       |         |          |          |               |           |
| attr_on            | attr_set                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |        |            |             |      |       |             |         |             |            |       |           |          |         |          |        |         |          |          |         |          |         |        |         |          |      |      |         |        |           |        |            |     |         |                  |        |       |       |         |          |          |               |           |
| attroff            | attron                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |        |            |             |      |       |             |         |             |            |       |           |          |         |          |        |         |          |          |         |          |         |        |         |          |      |      |         |        |           |        |            |     |         |                  |        |       |       |         |          |          |               |           |
| attrset            | baudrate                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |        |            |             |      |       |             |         |             |            |       |           |          |         |          |        |         |          |          |         |          |         |        |         |          |      |      |         |        |           |        |            |     |         |                  |        |       |       |         |          |          |               |           |
| beep               | bkgd                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |        |            |             |      |       |             |         |             |            |       |           |          |         |          |        |         |          |          |         |          |         |        |         |          |      |      |         |        |           |        |            |     |         |                  |        |       |       |         |          |          |               |           |
| bkgdset            | bkgdnd                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |        |            |             |      |       |             |         |             |            |       |           |          |         |          |        |         |          |          |         |          |         |        |         |          |      |      |         |        |           |        |            |     |         |                  |        |       |       |         |          |          |               |           |
| bkgdndset          | border                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |        |            |             |      |       |             |         |             |            |       |           |          |         |          |        |         |          |          |         |          |         |        |         |          |      |      |         |        |           |        |            |     |         |                  |        |       |       |         |          |          |               |           |
| border_set         | box                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |        |            |             |      |       |             |         |             |            |       |           |          |         |          |        |         |          |          |         |          |         |        |         |          |      |      |         |        |           |        |            |     |         |                  |        |       |       |         |          |          |               |           |
| box_set            | can_change_color                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |        |            |             |      |       |             |         |             |            |       |           |          |         |          |        |         |          |          |         |          |         |        |         |          |      |      |         |        |           |        |            |     |         |                  |        |       |       |         |          |          |               |           |
| cbreak             | chgat                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |        |            |             |      |       |             |         |             |            |       |           |          |         |          |        |         |          |          |         |          |         |        |         |          |      |      |         |        |           |        |            |     |         |                  |        |       |       |         |          |          |               |           |
| clear              | clearok                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |        |            |             |      |       |             |         |             |            |       |           |          |         |          |        |         |          |          |         |          |         |        |         |          |      |      |         |        |           |        |            |     |         |                  |        |       |       |         |          |          |               |           |
| clrtoBOT           | clrtoeol                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |        |            |             |      |       |             |         |             |            |       |           |          |         |          |        |         |          |          |         |          |         |        |         |          |      |      |         |        |           |        |            |     |         |                  |        |       |       |         |          |          |               |           |
| color_content      | color_set                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |        |            |             |      |       |             |         |             |            |       |           |          |         |          |        |         |          |          |         |          |         |        |         |          |      |      |         |        |           |        |            |     |         |                  |        |       |       |         |          |          |               |           |

|               |                |
|---------------|----------------|
| copywin       | cur_term       |
| curs_set      | curscr         |
| def_prog_mode | def_shell_mode |
| del_curterm   | delay_output   |
| delch         | deleteln       |
| delscreen     | delwin         |
| derwin        | doupdate       |
| dupwin        | echo           |
| echo_wchar    | echochar       |
| endwin        | erase          |
| erasechar     | eraseswchar    |
| filter        | flash          |
| flushinp      | get_wch        |
| get_wstr      | getbkgd        |
| getbkgrnd     | getcchar       |
| getch         | getn_wstr      |
| getnstr       | getstr         |
| getwin        | halfdelay      |
| has_colors    | has_ic         |
| has_il        | hline          |
| hline_set     | idcok          |
| idllok        | immedok        |
| in_wch        | in_wchnstr     |
| in_wchstr     | inch           |
| inchnstr      | inchstr        |
| init_color    | init_pair      |
| initscr       | innstr         |
| innwstr       | ins_nwstr      |
| ins_wch       | ins_wstr       |
| insch         | insdelln       |

libcurses(3XCURSES)

|                |               |
|----------------|---------------|
| insertln       | insnstr       |
| insstr         | instr         |
| intrflush      | inwstr        |
| is_linetouched | is_wintouched |
| isendwin       | key_name      |
| keyname        | keypad        |
| killchar       | killwchar     |
| leaveok        | longname      |
| meta           | move          |
| mvadd_wch      | mvadd_wchnstr |
| mvadd_wchstr   | mvaddch       |
| mvaddchnstr    | mvaddchstr    |
| mvaddnstr      | mvaddnwstr    |
| mvaddstr       | mvaddwstr     |
| mvchgat        | mvcur         |
| mvdelch        | mvderwin      |
| mvget_wch      | mvget_wstr    |
| mvgetch        | mvgetn_wstr   |
| mvgetnstr      | mvgetstr      |
| mvhline        | mvhline_set   |
| mvin_wch       | mvin_wchnstr  |
| mvin_wchstr    | mvinch        |
| mvinchnstr     | mvinchstr     |
| mvinnstr       | mvinnwstr     |
| mvins_nwstr    | mvins_wch     |
| mvins_wstr     | mvinsch       |
| mvinsnstr      | mvinsstr      |
| mvinstr        | mvinwstr      |
| mvprintw       | mvscanw       |
| mvvline        | mvvline_set   |

|               |                |
|---------------|----------------|
| mvwadd_wch    | mvwadd_wchnstr |
| mvwadd_wchstr | mvwaddch       |
| mvwaddchnstr  | mvwaddchstr    |
| mvwaddnstr    | mvwaddnwstr    |
| mvwaddstr     | mvwaddwstr     |
| mvwchgat      | mvwdelch       |
| mvwget_wch    | mvwget_wstr    |
| mvwgetch      | mvwgetn_wstr   |
| mvwgetnstr    | mvwgetstr      |
| mvwhline      | mvwhline_set   |
| mvwin         | mvwin_wch      |
| mvwin_wchnstr | mvwin_wchstr   |
| mvwinch       | mvwinchnstr    |
| mvwinchstr    | mvwinnstr      |
| mvwinnwstr    | mvwins_nwstr   |
| mvwins_wch    | mvwins_wstr    |
| mvwinsch      | mvwinsnstr     |
| mvwinsstr     | mvwinstr       |
| mvwinwstr     | mvwprintw      |
| mvwscanw      | mvwvline       |
| mvwvline_set  | napms          |
| newpad        | newterm        |
| newwin        | nl             |
| nocbreak      | nodelay        |
| noecho        | nonl           |
| noqiflush     | noraw          |
| notimeout     | overlay        |
| overwrite     | pair_content   |
| pecho_wchar   | pechochar      |
| pnoutrefresh  | prefresh       |

## libcurses(3XCURSES)

|                  |                 |
|------------------|-----------------|
| printw           | putp            |
| putwin           | qiflush         |
| raw              | redrawwin       |
| refresh          | reset_prog_mode |
| reset_shell_mode | resetty         |
| restartterm      | riporffline     |
| savetty          | scanw           |
| scr_dump         | scr_init        |
| scr_restore      | scr_set         |
| scrl             | scroll          |
| scrollok         | set_curterm     |
| set_term         | setcchar        |
| setscreg         | setupterm       |
| slk_attr_off     | slk_attr_on     |
| slk_attr_set     | slk_attroff     |
| slk_attron       | slk_attrset     |
| slk_clear        | slk_color       |
| slk_init         | slk_label       |
| slk_noutrefresh  | slk_refresh     |
| slk_restore      | slk_set         |
| slk_touch        | slk_wset        |
| standend         | standout        |
| start_color      | stdscr          |
| subpad           | subwin          |
| syncok           | term_attrs      |
| termattrs        | termname        |
| tgetent          | tgetflag        |
| tgetnum          | tgetstr         |
| tgoto            | tigetflag       |
| tigetnum         | tigetstr        |

|              |             |
|--------------|-------------|
| timeout      | touchline   |
| touchwin     | tparm       |
| tputs        | typeahead   |
| unctrl       | unget_wch   |
| ungetch      | untouchwin  |
| use_env      | vid_attr    |
| vid_puts     | vidattr     |
| vidputs      | vline       |
| vline_set    | vw_printw   |
| vw_scanw     | vwprintw    |
| vwscanw      | wadd_wch    |
| wadd_wchnstr | wadd_wchstr |
| waddch       | waddchnstr  |
| waddchstr    | waddnstr    |
| waddnwstr    | waddstr     |
| waddwstr     | wattr_get   |
| wattr_off    | wattr_on    |
| wattr_set    | wattroff    |
| wattron      | wattrset    |
| wbkgd        | wbkgdset    |
| wbkgrnd      | wbkgrndset  |
| wborder      | wborder_set |
| wchgat       | wclear      |
| wclrtoobot   | wclrtoeol   |
| wcolor_set   | wcursyncup  |
| wdelch       | wdeleteln   |
| wecho_wchar  | wechochar   |
| werase       | wget_wch    |
| wget_wstr    | wgetbkgrnd  |
| wgetch       | wgetn_wstr  |

## libcurses(3XCURSES)

|            |              |
|------------|--------------|
| wgetnstr   | wgetstr      |
| whline     | whline_set   |
| win_wch    | win_wchnstr  |
| win_wchstr | winch        |
| winchnstr  | winchstr     |
| winnstr    | winnwstr     |
| wins_nwstr | wins_wch     |
| wins_wstr  | winsch       |
| winsdelln  | winsertln    |
| winsnstr   | winsstr      |
| winstr     | winwstr      |
| wmove      | wnoutrefresh |
| wprintw    | wredrawln    |
| wrefresh   | wscanw       |
| wscr1      | wsetscrreg   |
| wstandend  | wstandout    |
| wsyncdown  | wsyncup      |
| wtimeout   | wtouchln     |
| wunctrl    | wvline       |
| wvline_set |              |

**FILES** /usr/xpg4/lib/libcurses.so.1  
shared object for backward compatibility

/usr/xpg4/lib/libcurses.so.2  
shared object

/usr/xpg4/lib/64/libcurses.so.1  
64-bit shared object for backward compatibility

/usr/xpg4/lib/64/libcurses.so.2  
64-bit shared object

**NOTES** The libcurses.so.1 listed above is an earlier shared object that provides the previous version of the X/Open Curses library (Issue 4). There is no binary compatibility between libcurses.so.1 and libcurses.so.2. This file is provided for backwards compatibility and will be removed in a future Solaris release. There is no plan to fix any of its defects.

**ATTRIBUTES** See `attributes(5)` for descriptions of the following attributes:

| ATTRIBUTE TYPE      | ATTRIBUTE VALUE                       |
|---------------------|---------------------------------------|
| Availability        | SUNWcsl (32-bit)<br>SUNWcslx (64-bit) |
| Interface Stability | Standard                              |
| MT-Level            | Unsafe                                |

**SEE ALSO** `intro(3)`, `curses(3XCURSES)`, `libcurses(3LIB)`, `libcurses(3LIBUCB)`, `attributes(5)`, `standards(5)`

## LINES(3XCURSES)

**NAME** LINES – number of lines on terminal screen

**SYNOPSIS**

```
cc [flag...] file... -I /usr/xpg4/include -L /usr/xpg4/lib \
-R /usr/xpg4/lib -lcurses [library...]
```

  

```
c89 [flag...] file... -lcurses [library ...]
```

  

```
#include <curses.h>
```

  

```
extern int LINES;
```

**DESCRIPTION** The external variable LINES indicates the number of lines on the terminal screen.

**ATTRIBUTES** See [attributes\(5\)](#) for descriptions of the following attributes:

| ATTRIBUTE TYPE      | ATTRIBUTE VALUE |
|---------------------|-----------------|
| Interface Stability | Standard        |
| MT-Level            | Unsafe          |

**SEE ALSO** [initscr\(3XCURSES\)](#), [libcurses\(3XCURSES\)](#), [attributes\(5\)](#), [standards\(5\)](#)

| <b>NAME</b>          | longname – return full terminal type name                                                                                                                                                                                                                                                                                                                                                                              |                |                 |                     |          |          |        |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-----------------|---------------------|----------|----------|--------|
| <b>SYNOPSIS</b>      | <pre>cc [ flag... ] file... -I /usr/xpg4/include -L /usr/xpg4/lib \ -R /usr/xpg4/lib -lcurses [ library... ]  c89 [ flag... ] file... -lcurses [ library... ]  #include &lt;curses.h&gt;  const char *longname(void);</pre>                                                                                                                                                                                            |                |                 |                     |          |          |        |
| <b>DESCRIPTION</b>   | The longname() function returns a pointer to a static area containing a verbose description (128 characters or fewer) of the terminal. The area is defined after calls to initscr(3XCURSES), newterm(3XCURSES), or setupterm(3XCURSES). The value should be saved if longname() is going to be used with multiple terminals since it will be overwritten with a new value after each call to newterm() or setupterm(). |                |                 |                     |          |          |        |
| <b>RETURN VALUES</b> | On success, the longname() function returns a pointer to a verbose description of the terminal. Otherwise, it returns a null pointer.                                                                                                                                                                                                                                                                                  |                |                 |                     |          |          |        |
| <b>ERRORS</b>        | None.                                                                                                                                                                                                                                                                                                                                                                                                                  |                |                 |                     |          |          |        |
| <b>ATTRIBUTES</b>    | See attributes(5) for descriptions of the following attributes:                                                                                                                                                                                                                                                                                                                                                        |                |                 |                     |          |          |        |
|                      | <table border="1"> <thead> <tr> <th>ATTRIBUTE TYPE</th> <th>ATTRIBUTE VALUE</th> </tr> </thead> <tbody> <tr> <td>Interface Stability</td> <td>Standard</td> </tr> <tr> <td>MT-Level</td> <td>Unsafe</td> </tr> </tbody> </table>                                                                                                                                                                                       | ATTRIBUTE TYPE | ATTRIBUTE VALUE | Interface Stability | Standard | MT-Level | Unsafe |
| ATTRIBUTE TYPE       | ATTRIBUTE VALUE                                                                                                                                                                                                                                                                                                                                                                                                        |                |                 |                     |          |          |        |
| Interface Stability  | Standard                                                                                                                                                                                                                                                                                                                                                                                                               |                |                 |                     |          |          |        |
| MT-Level             | Unsafe                                                                                                                                                                                                                                                                                                                                                                                                                 |                |                 |                     |          |          |        |
| <b>SEE ALSO</b>      | initscr(3XCURSES), libcurses(3XCURSES), newterm(3XCURSES), setupterm(3XCURSES), attributes(5), standards(5)                                                                                                                                                                                                                                                                                                            |                |                 |                     |          |          |        |

menu\_attributes(3CURSES)

**NAME** menu\_attributes, set\_menu\_fore, menu\_fore, set\_menu\_back, menu\_back, set\_menu\_grey, menu\_grey, set\_menu\_pad, menu\_pad – control menus display attributes

**SYNOPSIS**

```
cc [flag...] file... -lmenu -lcurses [library...]
#include <menu.h>

int set_menu_fore(MENU *menu, chtype attr);
chtype menu_fore(MENU *menu);

int set_menu_back(MENU *menu, chtype attr);
chtype menu_back(MENU *menu);

int set_menu_grey(MENU *menu, chtype attr);
chtype menu_grey(MENU *menu);

int set_menu_pad(MENU *menu, int pad);
int menu_pad(MENU *menu);
```

**DESCRIPTION**

set\_menu\_fore() sets the foreground attribute of *menu* — the display attribute for the current item (if selectable) on single-valued menus and for selected items on multi-valued menus. This display attribute is a curses library visual attribute. menu\_fore() returns the foreground attribute of *menu*.

set\_menu\_back() sets the background attribute of *menu* — the display attribute for unselected, yet selectable, items. This display attribute is a curses library visual attribute.

set\_menu\_grey() sets the grey attribute of *menu* — the display attribute for nonselectable items in multi-valued menus. This display attribute is a curses library visual attribute. menu\_grey() returns the grey attribute of *menu*.

The pad character is the character that fills the space between the name and description of an item. set\_menu\_pad() sets the pad character for *menu* to *pad*. menu\_pad() returns the pad character of *menu*.

**RETURN VALUES** These routines return one of the following:

|                |                                                  |
|----------------|--------------------------------------------------|
| E_OK           | The routine returned successfully.               |
| E_SYSTEM_ERROR | System error.                                    |
| E_BAD_ARGUMENT | An incorrect argument was passed to the routine. |

**ATTRIBUTES** See attributes(5) for descriptions of the following attributes:

| ATTRIBUTE TYPE | ATTRIBUTE VALUE |
|----------------|-----------------|
| MT-Level       | Unsafe          |

menu\_attributes(3CURSES)

**SEE ALSO** | curses(3CURSES), menus(3CURSES), attributes(5)

**NOTES** | The header <menu.h> automatically includes the headers <eti.h> and <curses.h>.

menu\_cursor(3CURSES)

**NAME** menu\_cursor, pos\_menu\_cursor – correctly position a menus cursor

**SYNOPSIS**

```
cc [flag...] file... -lmenu -lcurses [library...]
#include <menu.h>

int pos_menu_cursor (MENU *menu) ;
```

**DESCRIPTION** pos\_menu\_cursor() moves the cursor in the window of *menu* to the correct position to resume menu processing. This is needed after the application calls a curses library I/O routine.

**RETURN VALUES** This routine returns one of the following:

|                |                                                  |
|----------------|--------------------------------------------------|
| E_OK           | The routine returned successfully.               |
| E_SYSTEM_ERROR | System error.                                    |
| E_BAD_ARGUMENT | An incorrect argument was passed to the routine. |
| E_NOT_POSTED   | The menu has not been posted.                    |

**ATTRIBUTES** See attributes(5) for descriptions of the following attributes:

| ATTRIBUTE TYPE | ATTRIBUTE VALUE |
|----------------|-----------------|
| MT-Level       | Unsafe          |

**SEE ALSO** curses(3CURSES), menus(3CURSES), panel\_update(3CURSES), panels(3CURSES), attributes(5)

**NOTES** The header <menu.h> automatically includes the headers <eti.h> and <curses.h>.

|                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |               |                                    |                |                        |                |                                                  |               |                       |               |                   |               |                     |               |                   |               |                     |                |                         |               |                        |               |                        |               |                            |                 |                           |                   |                                |                  |                                                    |                |                              |                |                                     |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|------------------------------------|----------------|------------------------|----------------|--------------------------------------------------|---------------|-----------------------|---------------|-------------------|---------------|---------------------|---------------|-------------------|---------------|---------------------|----------------|-------------------------|---------------|------------------------|---------------|------------------------|---------------|----------------------------|-----------------|---------------------------|-------------------|--------------------------------|------------------|----------------------------------------------------|----------------|------------------------------|----------------|-------------------------------------|
| <b>NAME</b>          | menu_driver – command processor for the menus subsystem                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |               |                                    |                |                        |                |                                                  |               |                       |               |                   |               |                     |               |                   |               |                     |                |                         |               |                        |               |                        |               |                            |                 |                           |                   |                                |                  |                                                    |                |                              |                |                                     |
| <b>SYNOPSIS</b>      | <pre>cc [ flag... ] file... -lmenu -lcurses [ library... ] #include &lt;menu.h&gt;  int menu_driver(MENU *menu, int c);</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |               |                                    |                |                        |                |                                                  |               |                       |               |                   |               |                     |               |                   |               |                     |                |                         |               |                        |               |                        |               |                            |                 |                           |                   |                                |                  |                                                    |                |                              |                |                                     |
| <b>DESCRIPTION</b>   | <p>menu_driver() is the workhorse of the menus subsystem. It checks to determine whether the character <i>c</i> is a menu request or data. If <i>c</i> is a request, the menu driver executes the request and reports the result. If <i>c</i> is data (a printable ASCII character), it enters the data into the pattern buffer and tries to find a matching item. If no match is found, the menu driver deletes the character from the pattern buffer and returns E_NO_MATCH. If the character is not recognized, the menu driver assumes it is an application-defined command and returns E_UNKNOWN_COMMAND.</p> <p>Menu driver requests:</p> <table border="0"> <tr><td>REQ_LEFT_ITEM</td><td>Move left to an item.</td></tr> <tr><td>REQ_RIGHT_ITEM</td><td>Move right to an item.</td></tr> <tr><td>REQ_UP_ITEM</td><td>Move up to an item.</td></tr> <tr><td>REQ_DOWN_ITEM</td><td>Move down to an item.</td></tr> <tr><td>REQ_SCR_ULINE</td><td>Scroll up a line.</td></tr> <tr><td>REQ_SCR_DLINE</td><td>Scroll down a line.</td></tr> <tr><td>REQ_SCR_DPAGE</td><td>Scroll up a page.</td></tr> <tr><td>REQ_SCR_UPAGE</td><td>Scroll down a page.</td></tr> <tr><td>REQ_FIRST_ITEM</td><td>Move to the first item.</td></tr> <tr><td>REQ_LAST_ITEM</td><td>Move to the last item.</td></tr> <tr><td>REQ_NEXT_ITEM</td><td>Move to the next item.</td></tr> <tr><td>REQ_PREV_ITEM</td><td>Move to the previous item.</td></tr> <tr><td>REQ_TOGGLE_ITEM</td><td>Select/de-select an item.</td></tr> <tr><td>REQ_CLEAR_PATTERN</td><td>Clear the menu pattern buffer.</td></tr> <tr><td>REQ_BACK_PATTERN</td><td>Delete the previous character from pattern buffer.</td></tr> <tr><td>REQ_NEXT_MATCH</td><td>Move the next matching item.</td></tr> <tr><td>REQ_PREV_MATCH</td><td>Move to the previous matching item.</td></tr> </table> | REQ_LEFT_ITEM | Move left to an item.              | REQ_RIGHT_ITEM | Move right to an item. | REQ_UP_ITEM    | Move up to an item.                              | REQ_DOWN_ITEM | Move down to an item. | REQ_SCR_ULINE | Scroll up a line. | REQ_SCR_DLINE | Scroll down a line. | REQ_SCR_DPAGE | Scroll up a page. | REQ_SCR_UPAGE | Scroll down a page. | REQ_FIRST_ITEM | Move to the first item. | REQ_LAST_ITEM | Move to the last item. | REQ_NEXT_ITEM | Move to the next item. | REQ_PREV_ITEM | Move to the previous item. | REQ_TOGGLE_ITEM | Select/de-select an item. | REQ_CLEAR_PATTERN | Clear the menu pattern buffer. | REQ_BACK_PATTERN | Delete the previous character from pattern buffer. | REQ_NEXT_MATCH | Move the next matching item. | REQ_PREV_MATCH | Move to the previous matching item. |
| REQ_LEFT_ITEM        | Move left to an item.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |               |                                    |                |                        |                |                                                  |               |                       |               |                   |               |                     |               |                   |               |                     |                |                         |               |                        |               |                        |               |                            |                 |                           |                   |                                |                  |                                                    |                |                              |                |                                     |
| REQ_RIGHT_ITEM       | Move right to an item.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |               |                                    |                |                        |                |                                                  |               |                       |               |                   |               |                     |               |                   |               |                     |                |                         |               |                        |               |                        |               |                            |                 |                           |                   |                                |                  |                                                    |                |                              |                |                                     |
| REQ_UP_ITEM          | Move up to an item.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |               |                                    |                |                        |                |                                                  |               |                       |               |                   |               |                     |               |                   |               |                     |                |                         |               |                        |               |                        |               |                            |                 |                           |                   |                                |                  |                                                    |                |                              |                |                                     |
| REQ_DOWN_ITEM        | Move down to an item.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |               |                                    |                |                        |                |                                                  |               |                       |               |                   |               |                     |               |                   |               |                     |                |                         |               |                        |               |                        |               |                            |                 |                           |                   |                                |                  |                                                    |                |                              |                |                                     |
| REQ_SCR_ULINE        | Scroll up a line.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |               |                                    |                |                        |                |                                                  |               |                       |               |                   |               |                     |               |                   |               |                     |                |                         |               |                        |               |                        |               |                            |                 |                           |                   |                                |                  |                                                    |                |                              |                |                                     |
| REQ_SCR_DLINE        | Scroll down a line.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |               |                                    |                |                        |                |                                                  |               |                       |               |                   |               |                     |               |                   |               |                     |                |                         |               |                        |               |                        |               |                            |                 |                           |                   |                                |                  |                                                    |                |                              |                |                                     |
| REQ_SCR_DPAGE        | Scroll up a page.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |               |                                    |                |                        |                |                                                  |               |                       |               |                   |               |                     |               |                   |               |                     |                |                         |               |                        |               |                        |               |                            |                 |                           |                   |                                |                  |                                                    |                |                              |                |                                     |
| REQ_SCR_UPAGE        | Scroll down a page.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |               |                                    |                |                        |                |                                                  |               |                       |               |                   |               |                     |               |                   |               |                     |                |                         |               |                        |               |                        |               |                            |                 |                           |                   |                                |                  |                                                    |                |                              |                |                                     |
| REQ_FIRST_ITEM       | Move to the first item.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |               |                                    |                |                        |                |                                                  |               |                       |               |                   |               |                     |               |                   |               |                     |                |                         |               |                        |               |                        |               |                            |                 |                           |                   |                                |                  |                                                    |                |                              |                |                                     |
| REQ_LAST_ITEM        | Move to the last item.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |               |                                    |                |                        |                |                                                  |               |                       |               |                   |               |                     |               |                   |               |                     |                |                         |               |                        |               |                        |               |                            |                 |                           |                   |                                |                  |                                                    |                |                              |                |                                     |
| REQ_NEXT_ITEM        | Move to the next item.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |               |                                    |                |                        |                |                                                  |               |                       |               |                   |               |                     |               |                   |               |                     |                |                         |               |                        |               |                        |               |                            |                 |                           |                   |                                |                  |                                                    |                |                              |                |                                     |
| REQ_PREV_ITEM        | Move to the previous item.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |               |                                    |                |                        |                |                                                  |               |                       |               |                   |               |                     |               |                   |               |                     |                |                         |               |                        |               |                        |               |                            |                 |                           |                   |                                |                  |                                                    |                |                              |                |                                     |
| REQ_TOGGLE_ITEM      | Select/de-select an item.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |               |                                    |                |                        |                |                                                  |               |                       |               |                   |               |                     |               |                   |               |                     |                |                         |               |                        |               |                        |               |                            |                 |                           |                   |                                |                  |                                                    |                |                              |                |                                     |
| REQ_CLEAR_PATTERN    | Clear the menu pattern buffer.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |               |                                    |                |                        |                |                                                  |               |                       |               |                   |               |                     |               |                   |               |                     |                |                         |               |                        |               |                        |               |                            |                 |                           |                   |                                |                  |                                                    |                |                              |                |                                     |
| REQ_BACK_PATTERN     | Delete the previous character from pattern buffer.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |               |                                    |                |                        |                |                                                  |               |                       |               |                   |               |                     |               |                   |               |                     |                |                         |               |                        |               |                        |               |                            |                 |                           |                   |                                |                  |                                                    |                |                              |                |                                     |
| REQ_NEXT_MATCH       | Move the next matching item.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |               |                                    |                |                        |                |                                                  |               |                       |               |                   |               |                     |               |                   |               |                     |                |                         |               |                        |               |                        |               |                            |                 |                           |                   |                                |                  |                                                    |                |                              |                |                                     |
| REQ_PREV_MATCH       | Move to the previous matching item.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |               |                                    |                |                        |                |                                                  |               |                       |               |                   |               |                     |               |                   |               |                     |                |                         |               |                        |               |                        |               |                            |                 |                           |                   |                                |                  |                                                    |                |                              |                |                                     |
| <b>RETURN VALUES</b> | <p>menu_driver() returns one of the following:</p> <table border="0"> <tr><td>E_OK</td><td>The routine returned successfully.</td></tr> <tr><td>E_SYSTEM_ERROR</td><td>System error.</td></tr> <tr><td>E_BAD_ARGUMENT</td><td>An incorrect argument was passed to the routine.</td></tr> </table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | E_OK          | The routine returned successfully. | E_SYSTEM_ERROR | System error.          | E_BAD_ARGUMENT | An incorrect argument was passed to the routine. |               |                       |               |                   |               |                     |               |                   |               |                     |                |                         |               |                        |               |                        |               |                            |                 |                           |                   |                                |                  |                                                    |                |                              |                |                                     |
| E_OK                 | The routine returned successfully.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |               |                                    |                |                        |                |                                                  |               |                       |               |                   |               |                     |               |                   |               |                     |                |                         |               |                        |               |                        |               |                            |                 |                           |                   |                                |                  |                                                    |                |                              |                |                                     |
| E_SYSTEM_ERROR       | System error.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |               |                                    |                |                        |                |                                                  |               |                       |               |                   |               |                     |               |                   |               |                     |                |                         |               |                        |               |                        |               |                            |                 |                           |                   |                                |                  |                                                    |                |                              |                |                                     |
| E_BAD_ARGUMENT       | An incorrect argument was passed to the routine.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |               |                                    |                |                        |                |                                                  |               |                       |               |                   |               |                     |               |                   |               |                     |                |                         |               |                        |               |                        |               |                            |                 |                           |                   |                                |                  |                                                    |                |                              |                |                                     |

menu\_driver(3CURSES)

- E\_BAD\_STATE                    The routine was called from an initialization or termination function.
- E\_NOT\_POSTED                  The menu has not been posted.
- E\_UNKNOWN\_COMMAND          An unknown request was passed to the menu driver.
- E\_NO\_MATCH                    The character failed to match.
- E\_NOT\_SELECTABLE            The item cannot be selected.
- E\_REQUEST\_DENIED            The menu driver could not process the request.

**ATTRIBUTES**    See `attributes(5)` for descriptions of the following attributes:

| ATTRIBUTE TYPE | ATTRIBUTE VALUE |
|----------------|-----------------|
| MT-Level       | Unsafe          |

**SEE ALSO**    `curses(3CURSES)`, `menus(3CURSES)`, `attributes(5)`

**NOTES**      Application-defined commands should be defined relative to (greater than) `MAX_COMMAND`, the maximum value of a request listed above.

The header `<menu.h>` automatically includes the headers `<eti.h>` and `<curses.h>`.

**NAME** menu\_format, set\_menu\_format – set and get maximum numbers of rows and columns in menus

**SYNOPSIS**

```
cc [flag...] file... -lmenu -lcurses [library...]
#include <menu.h>

int set_menu_format(MENU *menu, int rows, int cols);
void menu_format(MENU *menu, int *rows, int *cols);
```

**DESCRIPTION** set\_menu\_format() sets the maximum number of rows and columns of items that may be displayed at one time on a menu. If the menu contains more items than can be displayed at once, the menu will be scrollable.

menu\_format() returns the maximum number of rows and columns that may be displayed at one time on menu. rows and cols are pointers to the variables used to return these values.

**RETURN VALUES** set\_menu\_format() returns one of the following:

- E\_OK The routine returned successfully.
- E\_SYSTEM\_ERROR System error.
- E\_BAD\_ARGUMENT An incorrect argument was passed to the routine.
- E\_POSTED The menu is already posted.

**ATTRIBUTES** See attributes(5) for descriptions of the following attributes:

| ATTRIBUTE TYPE | ATTRIBUTE VALUE |
|----------------|-----------------|
| MT-Level       | Unsafe          |

**SEE ALSO** curses(3CURSES), menus(3CURSES), attributes(5)

**NOTES** The header <menu.h> automatically includes the headers <eti.h> and <curses.h>.

## menu\_hook(3CURSES)

|                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |      |                                    |                |               |
|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------------------------------------|----------------|---------------|
| <b>NAME</b>          | menu_hook, set_item_init, item_init, set_item_term, item_term, set_menu_init, menu_init, set_menu_term, menu_term – assign application-specific routines for automatic invocation by menus                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |      |                                    |                |               |
| <b>SYNOPSIS</b>      | <pre>cc [ flag... ] file... -lmenu -lcurses [ library... ] #include &lt;menu.h&gt;  int set_item_init(MENU *menu, void (*func)(MENU *)); int set_item_term(MENU *menu, void (*func)(MENU *)); void item_term(MENU *menu); int set_menu_init(MENU *menu, void (*func)(MENU *)); void menu_init(MENU *menu); int set_menu_term(MENU *menu, void (*func)(MENU *)); void menu_term(MENU *menu);</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |      |                                    |                |               |
| <b>DESCRIPTION</b>   | <p>set_item_init() assigns the application-defined function to be called when the <i>menu</i> is posted and just after the current item changes. item_init() returns a pointer to the item initialization routine, if any, called when the <i>menu</i> is posted and just after the current item changes.</p> <p>set_item_term() assigns an application-defined function to be called when the <i>menu</i> is unposted and just before the current item changes. item_term() returns a pointer to the termination function, if any, called when the <i>menu</i> is unposted and just before the current item changes.</p> <p>set_menu_init() assigns an application-defined function to be called when the <i>menu</i> is posted and just after the top row changes on a posted menu. menu_init() returns a pointer to the menu initialization routine, if any, called when the <i>menu</i> is posted and just after the top row changes on a posted menu.</p> <p>set_menu_term() assigns an application-defined function to be called when the <i>menu</i> is unposted and just before the top row changes on a posted menu. menu_term() returns a pointer to the menu termination routine, if any, called when the <i>menu</i> is unposted and just before the top row changes on a posted menu.</p> |      |                                    |                |               |
| <b>RETURN VALUES</b> | <p>Routines that return pointers always return NULL on error. Routines that return an integer return one of the following:</p> <table><tr><td>E_OK</td><td>The routine returned successfully.</td></tr><tr><td>E_SYSTEM_ERROR</td><td>System error.</td></tr></table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | E_OK | The routine returned successfully. | E_SYSTEM_ERROR | System error. |
| E_OK                 | The routine returned successfully.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |      |                                    |                |               |
| E_SYSTEM_ERROR       | System error.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |      |                                    |                |               |
| <b>ATTRIBUTES</b>    | See attributes(5) for descriptions of the following attributes:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |      |                                    |                |               |

menu\_hook(3CURSES)

| ATTRIBUTE TYPE | ATTRIBUTE VALUE |
|----------------|-----------------|
| MT-Level       | Unsafe          |

**SEE ALSO** curses(3CURSES), menus(3CURSES), attributes(5)

**NOTES** The header <menu.h> automatically includes the headers <eti.h> and <curses.h>.

menu\_item\_current(3CURSES)

**NAME** menu\_item\_current, set\_current\_item, current\_item, set\_top\_row, top\_row, item\_index  
 – set and get current menus items

**SYNOPSIS** `cc [ flag... ] file... -lmenu -lcurses [ library... ]  
 #include <menu.h>`

```
int set_current_item(MENU *menu, ITEM *item);
ITEM *current_item(MENU *menu);
int set_top_row(MENU *menu, int row);
int top_row(MENU *menu);
int item_index(ITEM *item);
```

**DESCRIPTION** The current item of a menu is the item where the cursor is currently positioned. `set_current_item()` sets the current item of *menu* to *item*. `current_item()` returns a pointer to the the current item in *menu*.

`set_top_row()` sets the top row of *menu* to *row*. The left-most item on the new top row becomes the current item. `top_row()` returns the number of the menu row currently displayed at the top of *menu*.

`item_index()` returns the index to the *item* in the item pointer array. The value of this index ranges from 0 through *N*-1, where *N* is the total number of items connected to the menu.

**RETURN VALUES** `current_item()` returns NULL on error.

`top_row()` and `index_item()` return -1 on error.

`set_current_item()` and `set_top_row()` return one of the following:

|                 |                                                                        |
|-----------------|------------------------------------------------------------------------|
| E_OK            | The routine returned successfully.                                     |
| E_SYSTEM_ERROR  | System error.                                                          |
| E_BAD_ARGUMENT  | An incorrect argument was passed to the routine.                       |
| E_BAD_STATE     | The routine was called from an initialization or termination function. |
| E_NOT_CONNECTED | No items are connected to the menu.                                    |

**ATTRIBUTES** See `attributes(5)` for descriptions of the following attributes:

| ATTRIBUTE TYPE | ATTRIBUTE VALUE |
|----------------|-----------------|
| MT-Level       | Unsafe          |

**SEE ALSO** `curses(3CURSES)`, `menus(3CURSES)`, `attributes(5)`

`menu_item_current(3CURSES)`

**NOTES** | The header `<menu.h>` automatically includes the headers `<eti.h>` and `< curses.h>`.

## menu\_item\_name(3CURSES)

- NAME** menu\_item\_name, item\_name, item\_description – get menus item name and description
- SYNOPSIS**

```
cc [flag ...] file ... -lmenu -lcurses [library ..]
#include <menu.h>

char *item_name (ITEM *item) ;
char *item_description (ITEM *item) ;
```
- DESCRIPTION** item\_name() returns a pointer to the name of *item*.  
item\_description() returns a pointer to the description of *item*.
- RETURN VALUES** These routines return NULL on error.
- ATTRIBUTES** See attributes(5) for descriptions of the following attributes:

| ATTRIBUTE TYPE | ATTRIBUTE VALUE |
|----------------|-----------------|
| MT-Level       | Unsafe          |

**SEE ALSO** curses(3CURSES), menus(3CURSES), menu\_new(3CURSES), attributes(5)

**NOTES** The header <menu.h> automatically includes the headers <eti.h> and <curses.h>.

**NAME** menu\_item\_new, new\_item, free\_item – create and destroy menu items

**SYNOPSIS**

```
cc [flag...] file... -lmenu -lcurses [library...]
#include <menu.h>

ITEM *new_item(char *name, char *desc);
int free_item(ITEM *item);
```

**DESCRIPTION** new\_item() creates a new item from *name* and *description*, and returns a pointer to the new item.

free\_item() frees the storage allocated for *item*. Once an item is freed, the user can no longer connect it to a menu.

**RETURN VALUES** new\_item() returns NULL on error.

free\_item() returns one of the following:

- E\_OK The routine returned successfully.
- E\_SYSTEM\_ERROR System error.
- E\_BAD\_ARGUMENT An incorrect argument was passed to the routine.
- E\_CONNECTED One or more items are already connected to another menu.

**ATTRIBUTES** See attributes(5) for descriptions of the following attributes:

| ATTRIBUTE TYPE | ATTRIBUTE VALUE |
|----------------|-----------------|
| MT-Level       | Unsafe          |

**SEE ALSO** curses(3CURSES), menus(3CURSES), attributes(5)

**NOTES** The header <menu.h> automatically includes the headers <eti.h> and <curses.h>.

## menu\_item\_opts(3CURSES)

| <b>NAME</b>          | menu_item_opts, set_item_opts, item_opts_on, item_opts_off, item_opts – menus item option routines                                                                                                                                                                                                                                                                                                                                                                                                               |                |                 |          |        |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-----------------|----------|--------|
| <b>SYNOPSIS</b>      | <pre>cc [ flag... ] file... -lmenu -lcurses [ library... ] #include &lt;menu.h&gt;  int set_item_opts (ITEM *item, OPTIONS opts); int item_opts_on (ITEM *item, OPTIONS opts); int item_opts_off (ITEM *item, OPTIONS opts); OPTIONS item_opts (ITEM *item);</pre>                                                                                                                                                                                                                                               |                |                 |          |        |
| <b>DESCRIPTION</b>   | <p>set_item_opts() turns on the named options for <i>item</i> and turns off all other options. Options are boolean values that can be OR-ed together.</p> <p>item_opts_on() turns on the named options for <i>item</i>; no other option is changed.</p> <p>item_opts_off() turns off the named options for <i>item</i>; no other option is changed.</p> <p>item_opts() returns the current options of <i>item</i>.</p> <p>O_SELECTABLE                      The item can be selected during menu processing.</p> |                |                 |          |        |
| <b>RETURN VALUES</b> | <p>Except for item_opts(), these routines return one of the following:</p> <p>E_OK                                  The routine returned successfully.</p> <p>E_SYSTEM_ERROR                      System error.</p>                                                                                                                                                                                                                                                                                              |                |                 |          |        |
| <b>ATTRIBUTES</b>    | <p>See attributes(5) for descriptions of the following attributes:</p> <table border="1"><thead><tr><th>ATTRIBUTE TYPE</th><th>ATTRIBUTE VALUE</th></tr></thead><tbody><tr><td>MT-Level</td><td>Unsafe</td></tr></tbody></table>                                                                                                                                                                                                                                                                                 | ATTRIBUTE TYPE | ATTRIBUTE VALUE | MT-Level | Unsafe |
| ATTRIBUTE TYPE       | ATTRIBUTE VALUE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                |                 |          |        |
| MT-Level             | Unsafe                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                |                 |          |        |
| <b>SEE ALSO</b>      | curses(3CURSES), menus(3CURSES), attributes(5)                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                |                 |          |        |
| <b>NOTES</b>         | The header <menu.h> automatically includes the headers <eti.h> and <curses.h>.                                                                                                                                                                                                                                                                                                                                                                                                                                   |                |                 |          |        |

**NAME** menu\_items, set\_menu\_items, item\_count – connect and disconnect items to and from menus

**SYNOPSIS**

```
cc [flag...] file... -lmenu -lcurses [library...]
#include <menu.h>

int set_menu_items(MENU *menu, ITEM **items);
ITEM **menu_items(MENU *menu);
int item_count(MENU *menu);
```

**DESCRIPTION** set\_menu\_items() changes the item pointer array connected to *menu* to the item pointer array *items*. menu\_items() returns a pointer to the item pointer array connected to *menu*. item\_count() returns the number of items in *menu*.

**RETURN VALUES** menu\_items() returns NULL on error.

item\_count() returns -1 on error.

set\_menu\_items() returns one of the following:

|                |                                                          |
|----------------|----------------------------------------------------------|
| E_OK           | The routine returned successfully.                       |
| E_SYSTEM_ERROR | System error.                                            |
| E_BAD_ARGUMENT | An incorrect argument was passed to the routine.         |
| E_POSTED       | The menu is already posted.                              |
| E_CONNECTED    | One or more items are already connected to another menu. |

**ATTRIBUTES** See attributes(5) for descriptions of the following attributes:

| ATTRIBUTE TYPE | ATTRIBUTE VALUE |
|----------------|-----------------|
| MT-Level       | Unsafe          |

**SEE ALSO** curses(3CURSES), menus(3CURSES), attributes(5)

**NOTES** The header <menu.h> automatically includes the headers <eti.h> and <curses.h>.

## menu\_item\_userptr(3CURSES)

**NAME** menu\_item\_userptr, set\_item\_userptr, item\_userptr – associate application data with menus items

**SYNOPSIS**

```
cc [flag...] file... -lmenu -lcurses [library...]
#include <menu.h>

int set_item_userptr(ITEM *item, char *userptr);
char *item_userptr(ITEM *item);
```

**DESCRIPTION** Every item has an associated user pointer that can be used to store relevant information. `set_item_userptr()` sets the user pointer of `item`. `item_userptr()` returns the user pointer of `item`.

**RETURN VALUES** `item_userptr()` returns NULL on error. `set_item_userptr()` returns one of the following:

|                |                                    |
|----------------|------------------------------------|
| E_OK           | The routine returned successfully. |
| E_SYSTEM_ERROR | System error.                      |

**ATTRIBUTES** See `attributes(5)` for descriptions of the following attributes:

| ATTRIBUTE TYPE | ATTRIBUTE VALUE |
|----------------|-----------------|
| MT-Level       | Unsafe          |

**SEE ALSO** `curses(3CURSES)`, `menus(3CURSES)`, `attributes(5)`

**NOTES** The header `<menu.h>` automatically includes the headers `<eti.h>` and `<curses.h>`.

menu\_item\_value(3CURSES)

**NAME** menu\_item\_value, set\_item\_value, item\_value – set and get menus item values

**SYNOPSIS**

```
cc [flag...] file... -lmenu -lcurses [library...]
#include <menu.h>

int set_item_value (ITEM *item, int bool);
int item_value (ITEM *item);
```

**DESCRIPTION** Unlike single-valued menus, multi-valued menus enable the end-user to select one or more items from a menu. `set_item_value()` sets the selected value of the *item* — TRUE (selected) or FALSE (not selected). `set_item_value()` may be used only with multi-valued menus. To make a menu multi-valued, use `set_menu_opts` or `menu_opts_off()` to turn off the option `O_ONEVALUE`. (See `menu_opts(3CURSES)`).

`item_value()` returns the select value of *item*, either TRUE (selected) or FALSE (unselected).

**RETURN VALUES** `set_item_value()` returns one of the following:

- `E_OK` The routine returned successfully.
- `E_SYSTEM_ERROR` System error.
- `E_REQUEST_DENIED` The menu driver could not process the request.

**ATTRIBUTES** See `attributes(5)` for descriptions of the following attributes:

| ATTRIBUTE TYPE | ATTRIBUTE VALUE |
|----------------|-----------------|
| MT-Level       | Unsafe          |

**SEE ALSO** `curses(3CURSES)`, `menus(3CURSES)`, `menu_opts(3CURSES)`, `attributes(5)`

**NOTES** The header `<menu.h>` automatically includes the headers `<eti.h>` and `<curses.h>`.

## menu\_item\_visible(3CURSES)

**NAME** menu\_item\_visible, item\_visible – tell if menu item is visible

**SYNOPSIS** `cc [ flag ... ] file ... -lmenu -lcurses [ library .. ]  
#include <menu.h>`

```
int item_visible (ITEM *item);
```

**DESCRIPTION** A menu item is visible if it currently appears in the subwindow of a posted menu. `item_visible()` returns TRUE if *item* is visible, otherwise it returns FALSE.

**ATTRIBUTES** See `attributes(5)` for descriptions of the following attributes:

| ATTRIBUTE TYPE | ATTRIBUTE VALUE |
|----------------|-----------------|
| MT-Level       | Unsafe          |

**SEE ALSO** `curses(3CURSES)`, `menus(3CURSES)`, `menu_new(3CURSES)`, `attributes(5)`

**NOTES** The header `<menu.h>` automatically includes the headers `<eti.h>` and `<curses.h>`.

| <b>NAME</b>          | menu_mark, set_menu_mark – menus mark string routines                                                                                                                                                                                                                                                                             |                |                 |          |        |
|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-----------------|----------|--------|
| <b>SYNOPSIS</b>      | <pre>cc [ flag... ] file... -lmenu -lcurses [ library... ] #include &lt;menu.h&gt;  int set_menu_mark(MENU *menu, char *mark);  char *menu_mark(MENU *menu);</pre>                                                                                                                                                                |                |                 |          |        |
| <b>DESCRIPTION</b>   | menus displays mark strings to distinguish selected items in a menu (or the current item in a single-valued menu). set_menu_mark() sets the mark string of menu to mark. menu_mark() returns a pointer to the mark string of menu.                                                                                                |                |                 |          |        |
| <b>RETURN VALUES</b> | <p>menu_mark() returns NULL on error. set_menu_mark() returns one of the following:</p> <p>E_OK                                   The routine returned successfully.</p> <p>E_SYSTEM_ERROR                        System error.</p> <p>E_BAD_ARGUMENT                        An incorrect argument was passed to the routine.</p> |                |                 |          |        |
| <b>ATTRIBUTES</b>    | See attributes(5) for descriptions of the following attributes:                                                                                                                                                                                                                                                                   |                |                 |          |        |
|                      | <table border="1"> <thead> <tr> <th>ATTRIBUTE TYPE</th> <th>ATTRIBUTE VALUE</th> </tr> </thead> <tbody> <tr> <td>MT-Level</td> <td>Unsafe</td> </tr> </tbody> </table>                                                                                                                                                            | ATTRIBUTE TYPE | ATTRIBUTE VALUE | MT-Level | Unsafe |
| ATTRIBUTE TYPE       | ATTRIBUTE VALUE                                                                                                                                                                                                                                                                                                                   |                |                 |          |        |
| MT-Level             | Unsafe                                                                                                                                                                                                                                                                                                                            |                |                 |          |        |
| <b>SEE ALSO</b>      | curses(3CURSES), menus(3CURSES), attributes(5)                                                                                                                                                                                                                                                                                    |                |                 |          |        |
| <b>NOTES</b>         | The header <menu.h> automatically includes the headers <eti.h> and <curses.h>.                                                                                                                                                                                                                                                    |                |                 |          |        |

## menu\_new(3CURSES)

**NAME** menu\_new, new\_menu, free\_menu – create and destroy menus

**SYNOPSIS**

```
cc [flag...] file... -lmenu -lcurses [library...]
#include <menu.h>

MENU *new_menu (ITEM **items) ;
int free_menu (MENU *menu) ;
```

**DESCRIPTION** new\_menu () creates a new menu connected to the item pointer array *items* and returns a pointer to the new menu.

free\_menu () disconnects *menu* from its associated item pointer array and frees the storage allocated for the menu.

**RETURN VALUES** new\_menu () returns NULL on error.

free\_menu () returns one of the following:

|                |                                                  |
|----------------|--------------------------------------------------|
| E_OK           | The routine returned successfully.               |
| E_SYSTEM_ERROR | System error.                                    |
| E_BAD_ARGUMENT | An incorrect argument was passed to the routine. |
| E_POSTED       | The menu is already posted.                      |

**ATTRIBUTES** See attributes(5) for descriptions of the following attributes:

| ATTRIBUTE TYPE | ATTRIBUTE VALUE |
|----------------|-----------------|
| MT-Level       | Unsafe          |

**SEE ALSO** curses(3CURSES), menus(3CURSES), attributes(5)

**NOTES** The header <menu.h> automatically includes the headers <eti.h> and <curses.h>.

**NAME** menu\_opts, set\_menu\_opts, menu\_opts\_on, menu\_opts\_off – menus option routines

**SYNOPSIS**

```
cc [flag...] file... -lmenu -lcurses [library...]
#include <menu.h>

OPTIONS menu_opts (MENU *menu) ;

int set_menu_opts (MENU *menu, OPTIONS opts) ;

int menu_opts_on (MENU *menu, OPTIONS opts) ;

int menu_opts_off (MENU *menu, OPTIONS opts) ;
```

**DESCRIPTION**

**Menu Options**

set\_menu\_opts () turns on the named options for *menu* and turns off all other options. Options are boolean values that can be OR-ed together.

menu\_opts\_on () turns on the named options for *menu*; no other option is changed.

menu\_opts\_off () turns off the named options for *menu*; no other option is changed.

menu\_opts () returns the current options of *menu*.

The following values can be OR'd together to create *opts*.

|              |                                                              |
|--------------|--------------------------------------------------------------|
| O_ONEVALUE   | Only one item can be selected from the menu.                 |
| O_SHOWDESC   | Display the description of the items.                        |
| O_ROWMAJOR   | Display the menu in row major order.                         |
| O_IGNORECASE | Ignore the case when pattern matching.                       |
| O_SHOWMATCH  | Place the cursor within the item name when pattern matching. |
| O_NONCYCLIC  | Make certain menu driver requests non-cyclic.                |

**RETURN VALUES** Except for menu\_opts (), these routines return one of the following:

|                |                                    |
|----------------|------------------------------------|
| E_OK           | The routine returned successfully. |
| E_SYSTEM_ERROR | System error.                      |
| E_POSTED       | The menu is already posted.        |

**ATTRIBUTES** See attributes(5) for descriptions of the following attributes:

| ATTRIBUTE TYPE | ATTRIBUTE VALUE |
|----------------|-----------------|
| MT-Level       | Unsafe          |

**SEE ALSO** curses(3CURSES), menus(3CURSES), attributes(5)

menu\_opts(3CURSES)

**NOTES** | The header `<menu.h>` automatically includes the headers `<eti.h>` and `<curses.h>`.



## menu\_post(3CURSES)

| <b>NAME</b>          | menu_post, post_menu, unpost_menu – write or erase menus from associated subwindows                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                |                                    |                |               |                |                                                  |          |                             |             |                                                                        |           |                                             |              |                               |                 |                                     |
|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|------------------------------------|----------------|---------------|----------------|--------------------------------------------------|----------|-----------------------------|-------------|------------------------------------------------------------------------|-----------|---------------------------------------------|--------------|-------------------------------|-----------------|-------------------------------------|
| <b>SYNOPSIS</b>      | <pre>cc [ flag... ] file... -lmenu -lcurses [ library... ] #include &lt;menu.h&gt;  int post_menu (MENU *menu) ; int unpost_menu (MENU *menu) ;</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                |                                    |                |               |                |                                                  |          |                             |             |                                                                        |           |                                             |              |                               |                 |                                     |
| <b>DESCRIPTION</b>   | <p>post_menu () writes <i>menu</i> to the subwindow. The application programmer must use curses library routines to display the menu on the physical screen or call update_panels () if the panels library is being used.</p> <p>unpost_menu () erases <i>menu</i> from its associated subwindow.</p>                                                                                                                                                                                                                                                                                                                                                                                        |                |                                    |                |               |                |                                                  |          |                             |             |                                                                        |           |                                             |              |                               |                 |                                     |
| <b>RETURN VALUES</b> | <p>These routines return one of the following:</p> <table><tr><td>E_OK</td><td>The routine returned successfully.</td></tr><tr><td>E_SYSTEM_ERROR</td><td>System error.</td></tr><tr><td>E_BAD_ARGUMENT</td><td>An incorrect argument was passed to the routine.</td></tr><tr><td>E_POSTED</td><td>The menu is already posted.</td></tr><tr><td>E_BAD_STATE</td><td>The routine was called from an initialization or termination function.</td></tr><tr><td>E_NO_ROOM</td><td>The menu does not fit within its subwindow.</td></tr><tr><td>E_NOT_POSTED</td><td>The menu has not been posted.</td></tr><tr><td>E_NOT_CONNECTED</td><td>No items are connected to the menu.</td></tr></table> | E_OK           | The routine returned successfully. | E_SYSTEM_ERROR | System error. | E_BAD_ARGUMENT | An incorrect argument was passed to the routine. | E_POSTED | The menu is already posted. | E_BAD_STATE | The routine was called from an initialization or termination function. | E_NO_ROOM | The menu does not fit within its subwindow. | E_NOT_POSTED | The menu has not been posted. | E_NOT_CONNECTED | No items are connected to the menu. |
| E_OK                 | The routine returned successfully.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                |                                    |                |               |                |                                                  |          |                             |             |                                                                        |           |                                             |              |                               |                 |                                     |
| E_SYSTEM_ERROR       | System error.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                |                                    |                |               |                |                                                  |          |                             |             |                                                                        |           |                                             |              |                               |                 |                                     |
| E_BAD_ARGUMENT       | An incorrect argument was passed to the routine.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                |                                    |                |               |                |                                                  |          |                             |             |                                                                        |           |                                             |              |                               |                 |                                     |
| E_POSTED             | The menu is already posted.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                |                                    |                |               |                |                                                  |          |                             |             |                                                                        |           |                                             |              |                               |                 |                                     |
| E_BAD_STATE          | The routine was called from an initialization or termination function.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |                                    |                |               |                |                                                  |          |                             |             |                                                                        |           |                                             |              |                               |                 |                                     |
| E_NO_ROOM            | The menu does not fit within its subwindow.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                |                                    |                |               |                |                                                  |          |                             |             |                                                                        |           |                                             |              |                               |                 |                                     |
| E_NOT_POSTED         | The menu has not been posted.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                |                                    |                |               |                |                                                  |          |                             |             |                                                                        |           |                                             |              |                               |                 |                                     |
| E_NOT_CONNECTED      | No items are connected to the menu.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                |                                    |                |               |                |                                                  |          |                             |             |                                                                        |           |                                             |              |                               |                 |                                     |
| <b>ATTRIBUTES</b>    | <p>See attributes(5) for descriptions of the following attributes:</p> <table border="1"><thead><tr><th>ATTRIBUTE TYPE</th><th>ATTRIBUTE VALUE</th></tr></thead><tbody><tr><td>MT-Level</td><td>Unsafe</td></tr></tbody></table>                                                                                                                                                                                                                                                                                                                                                                                                                                                             | ATTRIBUTE TYPE | ATTRIBUTE VALUE                    | MT-Level       | Unsafe        |                |                                                  |          |                             |             |                                                                        |           |                                             |              |                               |                 |                                     |
| ATTRIBUTE TYPE       | ATTRIBUTE VALUE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                |                                    |                |               |                |                                                  |          |                             |             |                                                                        |           |                                             |              |                               |                 |                                     |
| MT-Level             | Unsafe                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |                                    |                |               |                |                                                  |          |                             |             |                                                                        |           |                                             |              |                               |                 |                                     |
| <b>SEE ALSO</b>      | curses(3CURSES), menus(3CURSES), panels(3CURSES), attributes(5)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                |                                    |                |               |                |                                                  |          |                             |             |                                                                        |           |                                             |              |                               |                 |                                     |
| <b>NOTES</b>         | The header <menu.h> automatically includes the headers <eti.h> and <curses.h>.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                |                                    |                |               |                |                                                  |          |                             |             |                                                                        |           |                                             |              |                               |                 |                                     |

| <b>NAME</b>                                       | menus – character based menus package                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                           |                         |                           |                                    |                        |                                |                        |                           |                         |                             |                               |                                 |                         |                                    |                        |                            |                        |                                 |                        |                                 |                            |                                 |                           |                                 |                        |                            |
|---------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|-------------------------|---------------------------|------------------------------------|------------------------|--------------------------------|------------------------|---------------------------|-------------------------|-----------------------------|-------------------------------|---------------------------------|-------------------------|------------------------------------|------------------------|----------------------------|------------------------|---------------------------------|------------------------|---------------------------------|----------------------------|---------------------------------|---------------------------|---------------------------------|------------------------|----------------------------|
| <b>SYNOPSIS</b>                                   | <code>#include &lt;menu.h&gt;</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                           |                         |                           |                                    |                        |                                |                        |                           |                         |                             |                               |                                 |                         |                                    |                        |                            |                        |                                 |                        |                                 |                            |                                 |                           |                                 |                        |                            |
| <b>DESCRIPTION</b>                                | <p>The menu library is built using the <code>curses</code> library, and any program using menu routines must call one of the <code>curses</code> initialization routines, such as <code>initscr</code>. A program using these routines must be compiled with <code>-lmenu</code> and <code>-lcurses</code> on the <code>cc</code> command line.</p> <p>The menu package gives the applications programmer a terminal-independent method of creating and customizing menus for user interaction. The menu package includes: item routines, which are used to create and customize menu items; and menu routines, which are used to create and customize menus, assign pre- and post-processing routines, and display and interact with menus.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                           |                         |                           |                                    |                        |                                |                        |                           |                         |                             |                               |                                 |                         |                                    |                        |                            |                        |                                 |                        |                                 |                            |                                 |                           |                                 |                        |                            |
| <b>Current Default Values for Item Attributes</b> | <p>The menu package establishes initial current default values for item attributes. During item initialization, each item attribute is assigned the current default value for that attribute. An application can change or retrieve a current default attribute value by calling the appropriate set or retrieve routine with a <code>NULL</code> item pointer. If an application changes a current default item attribute value, subsequent items created using <code>new_item()</code> will have the new default attribute value. The attributes of previously created items are not changed if a current default attribute value is changed.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                           |                         |                           |                                    |                        |                                |                        |                           |                         |                             |                               |                                 |                         |                                    |                        |                            |                        |                                 |                        |                                 |                            |                                 |                           |                                 |                        |                            |
| <b>Routine Name Index</b>                         | <p>The following table lists each menu routine and the name of the manual page on which it is described.</p> <table border="0" style="width: 100%;"> <thead> <tr> <th style="text-align: left;"><b>Menus Routine Name</b></th> <th style="text-align: left;"><b>Manual Page Name</b></th> </tr> </thead> <tbody> <tr> <td><code>current_item</code></td> <td><code>menu_item_current(3X)</code></td> </tr> <tr> <td><code>free_item</code></td> <td><code>menu_item_new(3X)</code></td> </tr> <tr> <td><code>free_menu</code></td> <td><code>menu_new(3X)</code></td> </tr> <tr> <td><code>item_count</code></td> <td><code>menu_items(3X)</code></td> </tr> <tr> <td><code>item_description</code></td> <td><code>menu_item_name(3X)</code></td> </tr> <tr> <td><code>item_index</code></td> <td><code>menu_item_current(3X)</code></td> </tr> <tr> <td><code>item_init</code></td> <td><code>menu_hook(3X)</code></td> </tr> <tr> <td><code>item_name</code></td> <td><code>menu_item_name(3X)</code></td> </tr> <tr> <td><code>item_opts</code></td> <td><code>menu_item_opts(3X)</code></td> </tr> <tr> <td><code>item_opts_off</code></td> <td><code>menu_item_opts(3X)</code></td> </tr> <tr> <td><code>item_opts_on</code></td> <td><code>menu_item_opts(3X)</code></td> </tr> <tr> <td><code>item_term</code></td> <td><code>menu_hook(3X)</code></td> </tr> </tbody> </table> | <b>Menus Routine Name</b> | <b>Manual Page Name</b> | <code>current_item</code> | <code>menu_item_current(3X)</code> | <code>free_item</code> | <code>menu_item_new(3X)</code> | <code>free_menu</code> | <code>menu_new(3X)</code> | <code>item_count</code> | <code>menu_items(3X)</code> | <code>item_description</code> | <code>menu_item_name(3X)</code> | <code>item_index</code> | <code>menu_item_current(3X)</code> | <code>item_init</code> | <code>menu_hook(3X)</code> | <code>item_name</code> | <code>menu_item_name(3X)</code> | <code>item_opts</code> | <code>menu_item_opts(3X)</code> | <code>item_opts_off</code> | <code>menu_item_opts(3X)</code> | <code>item_opts_on</code> | <code>menu_item_opts(3X)</code> | <code>item_term</code> | <code>menu_hook(3X)</code> |
| <b>Menus Routine Name</b>                         | <b>Manual Page Name</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                           |                         |                           |                                    |                        |                                |                        |                           |                         |                             |                               |                                 |                         |                                    |                        |                            |                        |                                 |                        |                                 |                            |                                 |                           |                                 |                        |                            |
| <code>current_item</code>                         | <code>menu_item_current(3X)</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                           |                         |                           |                                    |                        |                                |                        |                           |                         |                             |                               |                                 |                         |                                    |                        |                            |                        |                                 |                        |                                 |                            |                                 |                           |                                 |                        |                            |
| <code>free_item</code>                            | <code>menu_item_new(3X)</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                           |                         |                           |                                    |                        |                                |                        |                           |                         |                             |                               |                                 |                         |                                    |                        |                            |                        |                                 |                        |                                 |                            |                                 |                           |                                 |                        |                            |
| <code>free_menu</code>                            | <code>menu_new(3X)</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                           |                         |                           |                                    |                        |                                |                        |                           |                         |                             |                               |                                 |                         |                                    |                        |                            |                        |                                 |                        |                                 |                            |                                 |                           |                                 |                        |                            |
| <code>item_count</code>                           | <code>menu_items(3X)</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                           |                         |                           |                                    |                        |                                |                        |                           |                         |                             |                               |                                 |                         |                                    |                        |                            |                        |                                 |                        |                                 |                            |                                 |                           |                                 |                        |                            |
| <code>item_description</code>                     | <code>menu_item_name(3X)</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                           |                         |                           |                                    |                        |                                |                        |                           |                         |                             |                               |                                 |                         |                                    |                        |                            |                        |                                 |                        |                                 |                            |                                 |                           |                                 |                        |                            |
| <code>item_index</code>                           | <code>menu_item_current(3X)</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                           |                         |                           |                                    |                        |                                |                        |                           |                         |                             |                               |                                 |                         |                                    |                        |                            |                        |                                 |                        |                                 |                            |                                 |                           |                                 |                        |                            |
| <code>item_init</code>                            | <code>menu_hook(3X)</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                           |                         |                           |                                    |                        |                                |                        |                           |                         |                             |                               |                                 |                         |                                    |                        |                            |                        |                                 |                        |                                 |                            |                                 |                           |                                 |                        |                            |
| <code>item_name</code>                            | <code>menu_item_name(3X)</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                           |                         |                           |                                    |                        |                                |                        |                           |                         |                             |                               |                                 |                         |                                    |                        |                            |                        |                                 |                        |                                 |                            |                                 |                           |                                 |                        |                            |
| <code>item_opts</code>                            | <code>menu_item_opts(3X)</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                           |                         |                           |                                    |                        |                                |                        |                           |                         |                             |                               |                                 |                         |                                    |                        |                            |                        |                                 |                        |                                 |                            |                                 |                           |                                 |                        |                            |
| <code>item_opts_off</code>                        | <code>menu_item_opts(3X)</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                           |                         |                           |                                    |                        |                                |                        |                           |                         |                             |                               |                                 |                         |                                    |                        |                            |                        |                                 |                        |                                 |                            |                                 |                           |                                 |                        |                            |
| <code>item_opts_on</code>                         | <code>menu_item_opts(3X)</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                           |                         |                           |                                    |                        |                                |                        |                           |                         |                             |                               |                                 |                         |                                    |                        |                            |                        |                                 |                        |                                 |                            |                                 |                           |                                 |                        |                            |
| <code>item_term</code>                            | <code>menu_hook(3X)</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                           |                         |                           |                                    |                        |                                |                        |                           |                         |                             |                               |                                 |                         |                                    |                        |                            |                        |                                 |                        |                                 |                            |                                 |                           |                                 |                        |                            |

## menus(3CURSES)

| <b>Menus Routine Name</b> | <b>Manual Page Name</b> |
|---------------------------|-------------------------|
| item_userptr              | menu_item_userptr(3X)   |
| item_value                | menu_item_value(3X)     |
| item_visible              | menu_item_visible(3X)   |
| menu_back                 | menu_attributes(3X)     |
| menu_driver               | menu_driver(3X)         |
| menu_fore                 | menu_attributes(3X)     |
| menu_format               | menu_format(3X)         |
| menu_grey                 | menu_attributes(3X)     |
| menu_init                 | menu_hook(3X)           |
| menu_items                | menu_items(3X)          |
| menu_mark                 | menu_mark(3X)           |
| menu_opts                 | menu_opts(3X)           |
| menu_opts_off             | menu_opts(3X)           |
| menu_opts_on              | menu_opts(3X)           |
| menu_pad                  | menu_attributes(3X)     |
| menu_pattern              | menu_pattern(3X)        |
| menu_sub                  | menu_win(3X)            |
| menu_term                 | menu_hook(3X)           |
| menu_userptr              | menu_userptr(3X)        |
| menu_win                  | menu_win(3X)            |
| new_item                  | menu_item_new(3X)       |
| new_menu                  | menu_new(3X)            |
| pos_menu_cursor           | menu_cursor(3X)         |
| post_menu                 | menu_post(3X)           |
| scale_menu                | menu_win(3X)            |
| set_current_item          | menu_item_current(3X)   |
| set_item_init             | menu_hook(3X)           |
| set_item_opts             | menu_item_opts(3X)      |
| set_item_term             | menu_hook(3X)           |

## menus(3CURSES)

| Menus Routine Name | Manual Page Name       |
|--------------------|------------------------|
| set_item_userptr   | menu_item_userptr (3X) |
| set_item_value     | menu_item_value (3X)   |
| set_menu_back      | menu_attributes (3X)   |
| set_menu_fore      | menu_attributes (3X)   |
| set_menu_format    | menu_format (3X)       |
| set_menu_grey      | menu_attributes (3X)   |
| set_menu_init      | menu_hook (3X)         |
| set_menu_items     | menu_items (3X)        |
| set_menu_mark      | menu_mark (3X)         |
| set_menu_opts      | menu_opts (3X)         |
| set_menu_pad       | menu_attributes (3X)   |
| set_menu_pattern   | menu_pattern (3X)      |
| set_menu_sub       | menu_win (3X)          |
| set_menu_term      | menu_hook (3X)         |
| set_menu_userptr   | menu_userptr (3X)      |
| set_menu_win       | menu_win (3X)          |
| set_top_row        | menu_item_current (3X) |
| top_row            | menu_item_current (3X) |
| unpost_menu        | menu_post (3X)         |

### RETURN VALUES

Routines that return pointers always return NULL on error. Routines that return an integer return one of the following:

|                |                                                                        |
|----------------|------------------------------------------------------------------------|
| E_OK           | The routine returned successfully.                                     |
| E_SYSTEM_ERROR | System error.                                                          |
| E_BAD_ARGUMENT | An incorrect argument was passed to the routine.                       |
| E_POSTED       | The menu is already posted.                                            |
| E_CONNECTED    | One or more items are already connected to another menu.               |
| E_BAD_STATE    | The routine was called from an initialization or termination function. |

menus(3CURSES)

|                   |                                                   |
|-------------------|---------------------------------------------------|
| E_NO_ROOM         | The menu does not fit within its subwindow.       |
| E_NOT_POSTED      | The menu has not been posted.                     |
| E_UNKNOWN_COMMAND | An unknown request was passed to the menu driver. |
| E_NO_MATCH        | The character failed to match.                    |
| E_NOT_SELECTABLE  | The item cannot be selected.                      |
| E_NOT_CONNECTED   | No items are connected to the menu.               |
| E_REQUEST_DENIED  | The menu driver could not process the request.    |

**ATTRIBUTES** See `attributes(5)` for descriptions of the following attributes:

| ATTRIBUTE TYPE | ATTRIBUTE VALUE |
|----------------|-----------------|
| MT-Level       | Unsafe          |

**SEE ALSO** `curses(3CURSES)`, `attributes(5)`

**NOTES** The header `<menu.h>` automatically includes the headers `<eti.h>` and `<curses.h>`.

**NAME** menu\_userptr, set\_menu\_userptr – associate application data with menus

**SYNOPSIS**

```
cc [flag...] file... -lmenu -lcurses [library...]
#include <menu.h>

char *menu_userptr (MENU *menu) ;
int set_menu_userptr (MENU *menu, char *userptr) ;
```

**DESCRIPTION** Every menu has an associated user pointer that can be used to store relevant information. `set_menu_userptr()` sets the user pointer of `menu`. `menu_userptr()` returns the user pointer of `menu`.

**RETURN VALUES** `menu_userptr()` returns `NULL` on error.

`set_menu_userptr()` returns one of the following:

`E_OK` The routine returned successfully.

`E_SYSTEM_ERROR` System error.

**ATTRIBUTES** See `attributes(5)` for descriptions of the following attributes:

| ATTRIBUTE TYPE | ATTRIBUTE VALUE |
|----------------|-----------------|
| MT-Level       | Unsafe          |

**SEE ALSO** `curses(3CURSES)`, `menus(3CURSES)`, `attributes(5)`

**NOTES** The header `<menu.h>` automatically includes the headers `<eti.h>` and `<curses.h>`.

## menu\_win(3CURSES)

| <b>NAME</b>          | menu_win, set_menu_win, set_menu_sub, menu_sub, scale_menu – menus window and subwindow association routines                                                                                                                                                                                                                                                                                                                                                                                              |                |                                    |                |               |                |                                                  |          |                             |                 |                                     |
|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|------------------------------------|----------------|---------------|----------------|--------------------------------------------------|----------|-----------------------------|-----------------|-------------------------------------|
| <b>SYNOPSIS</b>      | <pre>cc [ flag... ] file... -lmenu -lcurses [ library... ] #include &lt;menu.h&gt;  int set_menu_win(MENU *menu, WINDOW *win); WINDOW *menu_win(MENU *menu);  int set_menu_sub(MENU *menu, WINDOW *sub); WINDOW *menu_sub(MENU *menu);  int scale_window(MENU *menu, int *rows, int *cols);</pre>                                                                                                                                                                                                         |                |                                    |                |               |                |                                                  |          |                             |                 |                                     |
| <b>DESCRIPTION</b>   | <p>set_menu_win() sets the window of <i>menu</i> to <i>win</i>. menu_win() returns a pointer to the window of <i>menu</i>. set_menu_sub() sets the subwindow of <i>menu</i> to <i>sub</i>. menu_sub() returns a pointer to the subwindow of <i>menu</i>. scale_window() returns the minimum window size necessary for the subwindow of <i>menu</i>. <i>rows</i> and <i>cols</i> are pointers to the locations used to return the values.</p>                                                              |                |                                    |                |               |                |                                                  |          |                             |                 |                                     |
| <b>RETURN VALUES</b> | <p>Routines that return pointers always return NULL on error. Routines that return an integer return one of the following:</p> <table><tr><td>E_OK</td><td>The routine returned successfully.</td></tr><tr><td>E_SYSTEM_ERROR</td><td>System error.</td></tr><tr><td>E_BAD_ARGUMENT</td><td>An incorrect argument was passed to the routine.</td></tr><tr><td>E_POSTED</td><td>The menu is already posted.</td></tr><tr><td>E_NOT_CONNECTED</td><td>No items are connected to the menu.</td></tr></table> | E_OK           | The routine returned successfully. | E_SYSTEM_ERROR | System error. | E_BAD_ARGUMENT | An incorrect argument was passed to the routine. | E_POSTED | The menu is already posted. | E_NOT_CONNECTED | No items are connected to the menu. |
| E_OK                 | The routine returned successfully.                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                |                                    |                |               |                |                                                  |          |                             |                 |                                     |
| E_SYSTEM_ERROR       | System error.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                |                                    |                |               |                |                                                  |          |                             |                 |                                     |
| E_BAD_ARGUMENT       | An incorrect argument was passed to the routine.                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                |                                    |                |               |                |                                                  |          |                             |                 |                                     |
| E_POSTED             | The menu is already posted.                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                |                                    |                |               |                |                                                  |          |                             |                 |                                     |
| E_NOT_CONNECTED      | No items are connected to the menu.                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |                                    |                |               |                |                                                  |          |                             |                 |                                     |
| <b>ATTRIBUTES</b>    | <p>See attributes(5) for descriptions of the following attributes:</p> <table border="1"><thead><tr><th>ATTRIBUTE TYPE</th><th>ATTRIBUTE VALUE</th></tr></thead><tbody><tr><td>MT-Level</td><td>Unsafe</td></tr></tbody></table>                                                                                                                                                                                                                                                                          | ATTRIBUTE TYPE | ATTRIBUTE VALUE                    | MT-Level       | Unsafe        |                |                                                  |          |                             |                 |                                     |
| ATTRIBUTE TYPE       | ATTRIBUTE VALUE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                |                                    |                |               |                |                                                  |          |                             |                 |                                     |
| MT-Level             | Unsafe                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                |                                    |                |               |                |                                                  |          |                             |                 |                                     |
| <b>SEE ALSO</b>      | curses(3CURSES), menus(3CURSES), attributes(5)                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                |                                    |                |               |                |                                                  |          |                             |                 |                                     |
| <b>NOTES</b>         | The header <menu.h> automatically includes the headers <eti.h> and <curses.h>.                                                                                                                                                                                                                                                                                                                                                                                                                            |                |                                    |                |               |                |                                                  |          |                             |                 |                                     |

| <b>NAME</b>          | meta – enable/disable meta keys                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                |                 |                     |          |          |        |
|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-----------------|---------------------|----------|----------|--------|
| <b>SYNOPSIS</b>      | <pre>cc [ flag... ] file... -I /usr/xpg4/include -L /usr/xpg4/lib \ -R /usr/xpg4/lib -lcurses [ library... ]  c89 [ flag... ] file... -lcurses [ library... ]  #include &lt;curses.h&gt;  int meta(WINDOW *win, bool bf);</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                |                 |                     |          |          |        |
| <b>PARAMETERS</b>    | <p><i>win</i> Is an ignored parameter.</p> <p><i>bf</i> Is a Boolean expression.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                |                 |                     |          |          |        |
| <b>DESCRIPTION</b>   | <p>Whether a terminal returns 7 or 8 significant bits initially depends on the control mode of the terminal driver. The <code>meta()</code> function forces the number of bits to be returned by <code>getch(3XCURSES)</code> to be 7 (if <i>bf</i> is <code>FALSE</code>) or 8 (if <i>bf</i> is <code>TRUE</code>).</p> <p>If the program handling the data can only pass 7-bit characters or strips the 8th bit, 8 bits cannot be handled.</p> <p>If the terminfo capabilities <code>smm</code> (<code>meta_on</code>) and <code>rmm</code> (<code>meta_off</code>) are defined for the terminal, <code>smm</code> is sent to the terminal when <code>meta(win, TRUE)</code> is called, and <code>rmm</code> is sent when <code>meta(win, FALSE)</code> is called.</p> <p>This function is useful when extending the non-text command set in applications where the META key is used.</p> |                |                 |                     |          |          |        |
| <b>RETURN VALUES</b> | On success, the <code>meta()</code> function returns <code>OK</code> . Otherwise, it returns <code>ERR</code> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                |                 |                     |          |          |        |
| <b>ERRORS</b>        | None.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |                 |                     |          |          |        |
| <b>ATTRIBUTES</b>    | See <code>attributes(5)</code> for descriptions of the following attributes:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                |                 |                     |          |          |        |
|                      | <table border="1"> <thead> <tr> <th>ATTRIBUTE TYPE</th> <th>ATTRIBUTE VALUE</th> </tr> </thead> <tbody> <tr> <td>Interface Stability</td> <td>Standard</td> </tr> <tr> <td>MT-Level</td> <td>Unsafe</td> </tr> </tbody> </table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | ATTRIBUTE TYPE | ATTRIBUTE VALUE | Interface Stability | Standard | MT-Level | Unsafe |
| ATTRIBUTE TYPE       | ATTRIBUTE VALUE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                |                 |                     |          |          |        |
| Interface Stability  | Standard                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                |                 |                     |          |          |        |
| MT-Level             | Unsafe                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                |                 |                     |          |          |        |
| <b>SEE ALSO</b>      | <code>getch(3XCURSES)</code> , <code>libcurses(3XCURSES)</code> , <code>attributes(5)</code> , <code>standards(5)</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                |                 |                     |          |          |        |

move(3XCURSES)

**NAME** move, wmove – move cursor in window

**SYNOPSIS**

```
cc [flag...] file... -I /usr/xpg4/include -L /usr/xpg4/lib \
-R /usr/xpg4/lib -lcurses [library...]

c89 [flag...] file... -lcurses [library...]

#include <curses.h>

int move(int y, int x);

int wmove(WINDOW *win, int y, int x);
```

**PARAMETERS**

|            |                                                                           |
|------------|---------------------------------------------------------------------------|
| <i>y</i>   | Is the y (row) coordinate of the position of the cursor in the window.    |
| <i>x</i>   | Is the x (column) coordinate of the position of the cursor in the window. |
| <i>win</i> | Is a pointer to the window in which the cursor is to be written.          |

**DESCRIPTION** The `move()` function moves the logical cursor (for `stdscr`) to the position specified by *y* (row) and *x* (column), where the upper left corner of the window is row 0, column 0. The `wmove()` function performs the same action, but moves the cursor in the window specified by *win*. The physical cursor will not move until after a call to `refresh(3XCURSES)` or `doupdate(3XCURSES)`.

**RETURN VALUES** On success, these functions return OK. Otherwise, they return ERR.

**ERRORS** None.

**ATTRIBUTES** See `attributes(5)` for descriptions of the following attributes:

| ATTRIBUTE TYPE      | ATTRIBUTE VALUE |
|---------------------|-----------------|
| Interface Stability | Standard        |
| MT-Level            | Unsafe          |

**SEE ALSO** `doupdate(3XCURSES)`, `libcurses(3XCURSES)`, `attributes(5)`, `standards(5)`

**NAME** mvcur – move the cursor

**SYNOPSIS** `cc [ flag... ] file... -I /usr/xpg4/include -L /usr/xpg4/lib \`  
`-R /usr/xpg4/lib -lcurses [ library... ]`

`c89 [ flag... ] file... -lcurses [ library... ]`

```
#include <curses.h>

int mvcur(int oldrow, int oldcol, int newrow, int newcol);
```

**PARAMETERS**

|               |                                                 |
|---------------|-------------------------------------------------|
| <i>oldrow</i> | Is the row from which cursor is to be moved.    |
| <i>oldcol</i> | Is the column from which cursor is to be moved. |
| <i>newrow</i> | Is the row to which cursor is to be moved.      |
| <i>newcol</i> | Is the column to which cursor is to be moved.   |

**DESCRIPTION** The mvcur() function is a low-level function used only outside of X/Open Curses when the program has to deal directly with the terminfo database to handle certain terminal capabilities. The use of appropriate X/Open Curses functions is recommended in all other situations, so that X/Open Curses can track the cursor.

The mvcur() function moves the cursor from the location specified by *oldrow* and *oldcol* to the location specified by *newrow* and *newcol*. A program using this function must keep track of the current cursor position.

**RETURN VALUES** On success, the mvcur() function returns OK. Otherwise, it returns ERR.

**ERRORS** None.

**ATTRIBUTES** See attributes(5) for descriptions of the following attributes:

| ATTRIBUTE TYPE      | ATTRIBUTE VALUE |
|---------------------|-----------------|
| Interface Stability | Standard        |
| MT-Level            | Unsafe          |

**SEE ALSO** libcurses(3XCURSES), attributes(5), standards(5)

## mvderwin(3XCURSES)

**NAME** mvderwin – map area of parent window to subwindow

**SYNOPSIS**

```
cc [flag...] file... -I /usr/xpg4/include -L /usr/xpg4/lib \
-R /usr/xpg4/lib -lcurses [library...]

c89 [flag...] file... -lcurses [library...]

#include <curses.h>

int mvderwin(WINDOW *win, int par_y, int par_x);
```

**PARAMETERS**

|              |                                                                                                                     |
|--------------|---------------------------------------------------------------------------------------------------------------------|
| <i>win</i>   | Is a pointer to the window to be mapped.                                                                            |
| <i>par_y</i> | Is the y (row) coordinate of the placement of the upper left corner of window relative to the parent window.        |
| <i>par_x</i> | Is the x (column) coordinate of the placement of the upper left corner of the window relative to the parent window. |

**DESCRIPTION**

The `mvderwin()` function defines a mapped area of *win*'s parent window that is the same size as *win* and has its upper left corner at position *par\_y*, *par\_x* of the parent window.

Whenever *win* is refreshed, its contents are updated to match those of the mapped area and any reference to characters in *win* is treated as a reference to corresponding characters in the mapped area.

**RETURN VALUES** On success, the `mvderwin()` function returns OK. Otherwise, it returns ERR.

**ERRORS** None.

**ATTRIBUTES** See `attributes(5)` for descriptions of the following attributes:

| ATTRIBUTE TYPE      | ATTRIBUTE VALUE |
|---------------------|-----------------|
| Interface Stability | Standard        |
| MT-Level            | Unsafe          |

**SEE ALSO** `delwin(3XCURSES)`, `derwin(3XCURSES)`, `libcurses(3XCURSES)`, `attributes(5)`, `standards(5)`

| <b>NAME</b>          | mvprintw, mvwprintw, printw, wprintw – print formatted output window                                                                                                                                                                                                                                                                                                        |                |                 |                     |          |          |        |
|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-----------------|---------------------|----------|----------|--------|
| <b>SYNOPSIS</b>      | <pre>cc [ flag... ] file... -I /usr/xpg4/include -L /usr/xpg4/lib \ -R /usr/xpg4/lib -lcurses [ library... ]  c89 [ flag... ] file... -lcurses [ library... ]  #include &lt;curses.h&gt;  int mvprintw(int y, int x, char *fmt, ...); int mvwprintw(WINDOW *win, int y, int x, char *fmt, ...); int printw(char *fmt, ...); int wprintw(WINDOW *win, char *fmt, ...);</pre> |                |                 |                     |          |          |        |
| <b>PARAMETERS</b>    | <p><i>y</i> Is the y (row) coordinate position of the string's placement in the window.</p> <p><i>x</i> Is the x (column) coordinate position of the string's placement in the window.</p> <p><i>fmt</i> Is a printf() format string.</p> <p><i>win</i> Is a pointer to the window in which the string is to be written.</p>                                                |                |                 |                     |          |          |        |
| <b>DESCRIPTION</b>   | The mvprintw(), mvwprintw(), printw(), and wprintw() functions are analogous to printf(3C). The effect of these functions is as though sprintf() were used to format the string, and then waddstr(3XCURSES) were used to add that multi-byte string to the current or specified window at the current or specified cursor position.                                         |                |                 |                     |          |          |        |
| <b>RETURN VALUES</b> | Upon successful completion, these functions return OK. Otherwise, they return ERR.                                                                                                                                                                                                                                                                                          |                |                 |                     |          |          |        |
| <b>ERRORS</b>        | No errors are defined.                                                                                                                                                                                                                                                                                                                                                      |                |                 |                     |          |          |        |
| <b>ATTRIBUTES</b>    | See attributes(5) for descriptions of the following attributes:                                                                                                                                                                                                                                                                                                             |                |                 |                     |          |          |        |
|                      | <table border="1"> <thead> <tr> <th>ATTRIBUTE TYPE</th> <th>ATTRIBUTE VALUE</th> </tr> </thead> <tbody> <tr> <td>Interface Stability</td> <td>Standard</td> </tr> <tr> <td>MT-Level</td> <td>Unsafe</td> </tr> </tbody> </table>                                                                                                                                            | ATTRIBUTE TYPE | ATTRIBUTE VALUE | Interface Stability | Standard | MT-Level | Unsafe |
| ATTRIBUTE TYPE       | ATTRIBUTE VALUE                                                                                                                                                                                                                                                                                                                                                             |                |                 |                     |          |          |        |
| Interface Stability  | Standard                                                                                                                                                                                                                                                                                                                                                                    |                |                 |                     |          |          |        |
| MT-Level             | Unsafe                                                                                                                                                                                                                                                                                                                                                                      |                |                 |                     |          |          |        |
| <b>SEE ALSO</b>      | addnstr(3XCURSES), libcurses(3XCURSES), printf(3C), attributes(5), standards(5)                                                                                                                                                                                                                                                                                             |                |                 |                     |          |          |        |

mvscanw(3XCURSES)

**NAME** mvscanw, mvwscanw, scanw, wscanw – convert formatted input from a window

**SYNOPSIS** `cc [ flag... ] file... -I /usr/xpg4/include -L /usr/xpg4/lib \`  
`-R /usr/xpg4/lib -lcurses [ library... ]`

**c89** `[ flag... ] file... -lcurses [ library... ]`

```
#include <curses.h>
int mvscanw(int y, int x, char *fmt, ...);
int mvwscanw(WINDOW *win, int y, int x, char *fmt, ...);
int scanw(char *fmt, ...);
int wscanw(WINDOW *win, char *fmt, ...);
```

**PARAMETERS**

*y* Is the y (row) coordinate of the position of the character to be read.

*x* Is the x (column) coordinate of the position of the character to be read.

*fmt* Is a scanf () format string.

*win* Is a pointer to the window in which the character is to be read.

**DESCRIPTION** These functions are similar to scanf(3C). Their effect is as though mvwgetstr(3XCURSES) were called to get a multi-byte character string from the current or specified window at the current or specified cursor position, and then sscanf () were used to interpret and convert that string.

**RETURN VALUES** Upon successful completion, these functions return OK. Otherwise, they return ERR.

**ERRORS** No errors are defined.

**ATTRIBUTES** See attributes(5) for descriptions of the following attributes:

| ATTRIBUTE TYPE      | ATTRIBUTE VALUE |
|---------------------|-----------------|
| Interface Stability | Standard        |
| MT-Level            | Unsafe          |

**SEE ALSO** getnstr(3XCURSES), libcurses(3XCURSES), printw(3XCURSES), scanf(3C), wcstombs(3C), attributes(5), standards(5)

| <b>NAME</b>          | mvwin – move window                                                                                                                                                                                                                                                                                                                                     |                |                                     |                     |                                                                   |          |                                                                      |
|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------------------------------------|---------------------|-------------------------------------------------------------------|----------|----------------------------------------------------------------------|
| <b>SYNOPSIS</b>      | <pre>cc [ flag... ] file... -I /usr/xpg4/include -L /usr/xpg4/lib \ -R /usr/xpg4/lib -lcurses [ library... ]  c89 [ flag... ] file... -lcurses [ library... ]  #include &lt;curses.h&gt;  int mvwin(WINDOW *win, int y, int x);</pre>                                                                                                                   |                |                                     |                     |                                                                   |          |                                                                      |
| <b>PARAMETERS</b>    | <table border="0"> <tr> <td style="padding-right: 20px;"><i>win</i></td> <td>Is a pointer to the window to move.</td> </tr> <tr> <td><i>y</i></td> <td>Is the y (row) coordinate of the upper left corner of the window.</td> </tr> <tr> <td><i>x</i></td> <td>Is the x (column) coordinate of the upper left corner of the window.</td> </tr> </table> | <i>win</i>     | Is a pointer to the window to move. | <i>y</i>            | Is the y (row) coordinate of the upper left corner of the window. | <i>x</i> | Is the x (column) coordinate of the upper left corner of the window. |
| <i>win</i>           | Is a pointer to the window to move.                                                                                                                                                                                                                                                                                                                     |                |                                     |                     |                                                                   |          |                                                                      |
| <i>y</i>             | Is the y (row) coordinate of the upper left corner of the window.                                                                                                                                                                                                                                                                                       |                |                                     |                     |                                                                   |          |                                                                      |
| <i>x</i>             | Is the x (column) coordinate of the upper left corner of the window.                                                                                                                                                                                                                                                                                    |                |                                     |                     |                                                                   |          |                                                                      |
| <b>DESCRIPTION</b>   | The mvwin() function moves the specified window (or subwindow), placing its upper left corner at the positions specified by <i>x</i> and <i>y</i> . The entire window must fit within the physical boundaries of the screen or an error results. In the case of a subwindow, the window must remain within the boundaries of the parent window.         |                |                                     |                     |                                                                   |          |                                                                      |
| <b>RETURN VALUES</b> | On success, the mvwin() function returns OK. Otherwise, it returns ERR.                                                                                                                                                                                                                                                                                 |                |                                     |                     |                                                                   |          |                                                                      |
| <b>ERRORS</b>        | None.                                                                                                                                                                                                                                                                                                                                                   |                |                                     |                     |                                                                   |          |                                                                      |
| <b>ATTRIBUTES</b>    | See attributes(5) for descriptions of the following attributes:                                                                                                                                                                                                                                                                                         |                |                                     |                     |                                                                   |          |                                                                      |
|                      | <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">ATTRIBUTE TYPE</th> <th style="text-align: center;">ATTRIBUTE VALUE</th> </tr> </thead> <tbody> <tr> <td>Interface Stability</td> <td>Standard</td> </tr> <tr> <td>MT-Level</td> <td>Unsafe</td> </tr> </tbody> </table>                | ATTRIBUTE TYPE | ATTRIBUTE VALUE                     | Interface Stability | Standard                                                          | MT-Level | Unsafe                                                               |
| ATTRIBUTE TYPE       | ATTRIBUTE VALUE                                                                                                                                                                                                                                                                                                                                         |                |                                     |                     |                                                                   |          |                                                                      |
| Interface Stability  | Standard                                                                                                                                                                                                                                                                                                                                                |                |                                     |                     |                                                                   |          |                                                                      |
| MT-Level             | Unsafe                                                                                                                                                                                                                                                                                                                                                  |                |                                     |                     |                                                                   |          |                                                                      |
| <b>SEE ALSO</b>      | derwin(3XCURSES), libcurses(3XCURSES), attributes(5), standards(5)                                                                                                                                                                                                                                                                                      |                |                                     |                     |                                                                   |          |                                                                      |

## napms(3XCURSES)

**NAME** napms – sleep process for a specified length of time

**SYNOPSIS**

```
cc [flag...] file... -I /usr/xpg4/include -L /usr/xpg4/lib \
-R /usr/xpg4/lib -lcurses [library...]

c89 [flag...] file... -lcurses [library...]

#include <curses.h>

int napms(int ms);
```

**PARAMETERS** *ms* Is the number of milliseconds to sleep.

**DESCRIPTION** The napms () function sleeps for at least *ms* milliseconds.

**RETURN VALUES** The napms () function always returns OK.

**ERRORS** None.

**ATTRIBUTES** See attributes(5) for descriptions of the following attributes:

| ATTRIBUTE TYPE      | ATTRIBUTE VALUE |
|---------------------|-----------------|
| Interface Stability | Standard        |
| MT-Level            | Unsafe          |

**SEE ALSO** delay\_output(3XCURSES), libcurses(3XCURSES), attributes(5), standards(5)

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |               |                                                  |              |                                                    |            |                                     |                |                                                                                  |                |                                                                                      |                |                                                                                                                       |                |                                                                                                                          |                |                                                                                                                            |                |                                                                                                                               |             |                                                                   |
|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|--------------------------------------------------|--------------|----------------------------------------------------|------------|-------------------------------------|----------------|----------------------------------------------------------------------------------|----------------|--------------------------------------------------------------------------------------|----------------|-----------------------------------------------------------------------------------------------------------------------|----------------|--------------------------------------------------------------------------------------------------------------------------|----------------|----------------------------------------------------------------------------------------------------------------------------|----------------|-------------------------------------------------------------------------------------------------------------------------------|-------------|-------------------------------------------------------------------|
| <b>NAME</b>        | newpad, pnoutrefresh, prefresh, subpad – create or refresh a pad or subpad                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |               |                                                  |              |                                                    |            |                                     |                |                                                                                  |                |                                                                                      |                |                                                                                                                       |                |                                                                                                                          |                |                                                                                                                            |                |                                                                                                                               |             |                                                                   |
| <b>SYNOPSIS</b>    | <pre>cc [ flag... ] file... -I /usr/xpg4/include -L /usr/xpg4/lib \ -R /usr/xpg4/lib -lcurses [ library... ]  c89 [ flag... ] file... -lcurses [ library... ]  #include &lt;curses.h&gt;  WINDOW *newpad(int nlines, int ncols);  int pnoutrefresh(WINDOW *pad, int pminrow, int pmincol, int sminrow, int smincol, int smaxrow, int smaxcol);  int prefresh(WINDOW *pad, int pminrow, int pmincol, int sminrow, int smincol, int smaxrow, int smaxcol);  WINDOW *subpad(WINDOW *orig, int nlines, int ncols);</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |               |                                                  |              |                                                    |            |                                     |                |                                                                                  |                |                                                                                      |                |                                                                                                                       |                |                                                                                                                          |                |                                                                                                                            |                |                                                                                                                               |             |                                                                   |
| <b>PARAMETERS</b>  | <table border="0"> <tr> <td style="padding-right: 20px;"><i>nlines</i></td> <td>Is the number of lines in the pad to be created.</td> </tr> <tr> <td><i>ncols</i></td> <td>Is the number of columns in the pad to be created.</td> </tr> <tr> <td><i>pad</i></td> <td>Is a pointer to the pad to refresh.</td> </tr> <tr> <td><i>pminrow</i></td> <td>Is the row coordinate of the upper left corner of the pad rectangle to be copied</td> </tr> <tr> <td><i>pmincol</i></td> <td>Is the column coordinate of the upper left corner of the pad rectangle to be copied.</td> </tr> <tr> <td><i>sminrow</i></td> <td>Is the row coordinate of the upper left corner of the rectangle on the physical screen where pad is to be positioned.</td> </tr> <tr> <td><i>smincol</i></td> <td>Is the column coordinate of the upper left corner of the rectangle on the physical screen where pad is to be positioned.</td> </tr> <tr> <td><i>smaxrow</i></td> <td>Is the row coordinate of the lower right corner of the rectangle on the physical screen where the pad is to be positioned.</td> </tr> <tr> <td><i>smaxcol</i></td> <td>Is the column coordinate of the lower right corner of the rectangle on the physical screen where the pad is to be positioned.</td> </tr> <tr> <td><i>orig</i></td> <td>Is a pointer to the parent pad within which a sub-pad is created.</td> </tr> </table> | <i>nlines</i> | Is the number of lines in the pad to be created. | <i>ncols</i> | Is the number of columns in the pad to be created. | <i>pad</i> | Is a pointer to the pad to refresh. | <i>pminrow</i> | Is the row coordinate of the upper left corner of the pad rectangle to be copied | <i>pmincol</i> | Is the column coordinate of the upper left corner of the pad rectangle to be copied. | <i>sminrow</i> | Is the row coordinate of the upper left corner of the rectangle on the physical screen where pad is to be positioned. | <i>smincol</i> | Is the column coordinate of the upper left corner of the rectangle on the physical screen where pad is to be positioned. | <i>smaxrow</i> | Is the row coordinate of the lower right corner of the rectangle on the physical screen where the pad is to be positioned. | <i>smaxcol</i> | Is the column coordinate of the lower right corner of the rectangle on the physical screen where the pad is to be positioned. | <i>orig</i> | Is a pointer to the parent pad within which a sub-pad is created. |
| <i>nlines</i>      | Is the number of lines in the pad to be created.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |               |                                                  |              |                                                    |            |                                     |                |                                                                                  |                |                                                                                      |                |                                                                                                                       |                |                                                                                                                          |                |                                                                                                                            |                |                                                                                                                               |             |                                                                   |
| <i>ncols</i>       | Is the number of columns in the pad to be created.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |               |                                                  |              |                                                    |            |                                     |                |                                                                                  |                |                                                                                      |                |                                                                                                                       |                |                                                                                                                          |                |                                                                                                                            |                |                                                                                                                               |             |                                                                   |
| <i>pad</i>         | Is a pointer to the pad to refresh.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |               |                                                  |              |                                                    |            |                                     |                |                                                                                  |                |                                                                                      |                |                                                                                                                       |                |                                                                                                                          |                |                                                                                                                            |                |                                                                                                                               |             |                                                                   |
| <i>pminrow</i>     | Is the row coordinate of the upper left corner of the pad rectangle to be copied                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |               |                                                  |              |                                                    |            |                                     |                |                                                                                  |                |                                                                                      |                |                                                                                                                       |                |                                                                                                                          |                |                                                                                                                            |                |                                                                                                                               |             |                                                                   |
| <i>pmincol</i>     | Is the column coordinate of the upper left corner of the pad rectangle to be copied.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |               |                                                  |              |                                                    |            |                                     |                |                                                                                  |                |                                                                                      |                |                                                                                                                       |                |                                                                                                                          |                |                                                                                                                            |                |                                                                                                                               |             |                                                                   |
| <i>sminrow</i>     | Is the row coordinate of the upper left corner of the rectangle on the physical screen where pad is to be positioned.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |               |                                                  |              |                                                    |            |                                     |                |                                                                                  |                |                                                                                      |                |                                                                                                                       |                |                                                                                                                          |                |                                                                                                                            |                |                                                                                                                               |             |                                                                   |
| <i>smincol</i>     | Is the column coordinate of the upper left corner of the rectangle on the physical screen where pad is to be positioned.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |               |                                                  |              |                                                    |            |                                     |                |                                                                                  |                |                                                                                      |                |                                                                                                                       |                |                                                                                                                          |                |                                                                                                                            |                |                                                                                                                               |             |                                                                   |
| <i>smaxrow</i>     | Is the row coordinate of the lower right corner of the rectangle on the physical screen where the pad is to be positioned.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |               |                                                  |              |                                                    |            |                                     |                |                                                                                  |                |                                                                                      |                |                                                                                                                       |                |                                                                                                                          |                |                                                                                                                            |                |                                                                                                                               |             |                                                                   |
| <i>smaxcol</i>     | Is the column coordinate of the lower right corner of the rectangle on the physical screen where the pad is to be positioned.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |               |                                                  |              |                                                    |            |                                     |                |                                                                                  |                |                                                                                      |                |                                                                                                                       |                |                                                                                                                          |                |                                                                                                                            |                |                                                                                                                               |             |                                                                   |
| <i>orig</i>        | Is a pointer to the parent pad within which a sub-pad is created.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |               |                                                  |              |                                                    |            |                                     |                |                                                                                  |                |                                                                                      |                |                                                                                                                       |                |                                                                                                                          |                |                                                                                                                            |                |                                                                                                                               |             |                                                                   |
| <b>DESCRIPTION</b> | The newpad() function creates a new pad with the specified number of lines and columns. A pointer to the new pad structure is returned. A pad differs from a window in that it is not restricted to the size of the physical screen. It is useful when only part of a large window will be displayed at any one time.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |               |                                                  |              |                                                    |            |                                     |                |                                                                                  |                |                                                                                      |                |                                                                                                                       |                |                                                                                                                          |                |                                                                                                                            |                |                                                                                                                               |             |                                                                   |

## newpad(3XCURSES)

Automatic refreshes by scrolling or echoing of input do not take place when pads are used. Pads have their own refresh commands, `prefresh()` and `pnoutrefresh()`.

The `prefresh()` function copies the specified portion of the logical pad to the terminal screen. The parameters `pmincol` and `pminrow` specify the upper left corner of the rectangular area of the pad to be displayed. The lower right coordinate of the rectangular area of the pad that is to be displayed is calculated from the screen parameters (`sminrow`, `smincol`, `smaxrow`, `smaxcol`).

This function calls the `pnoutrefresh()` function to copy the specified portion of *pad* to the terminal screen and the `doupdate(3XCURSES)` function to do the actual update. The logical cursor is copied to the same location in the physical window unless `leaveok(3XCURSES)` is enabled (in which case, the cursor is placed in a position that the program finds convenient).

When outputting several pads at once, it is often more efficient to call the `pnoutrefresh()` and `doupdate()` functions directly. A call to `pnoutrefresh()` for each pad first, followed by only one call to `doupdate()` to update the screen, results in one burst of output, fewer characters sent, and less CPU time used.

The `subpad()` function creates a sub-pad within the pad *orig* with the specified number of lines and columns. A pointer to the new pad structure is returned. The sub-pad is positioned in the middle of *orig*. Any changes made to one pad affect the other. `touchwin(3XCURSES)` or `touchline(3XCURSES)` will likely have to be called on pad *orig* to correctly update the window.

**RETURN VALUES** On success, the `newpad()` and `subpad()` functions returns a pointer to the new pad data structure. Otherwise, they return a null pointer.

On success, the `pnoutrefresh()` and `prefresh()` functions return `OK`. Otherwise, they return `ERR`.

**ATTRIBUTES** See `attributes(5)` for descriptions of the following attributes:

| ATTRIBUTE TYPE      | ATTRIBUTE VALUE |
|---------------------|-----------------|
| Interface Stability | Standard        |
| MT-Level            | Unsafe          |

**SEE ALSO** `clearok(3XCURSES)`, `doupdate(3XCURSES)`, `is_linetouched(3XCURSES)`, `libcurses(3XCURSES)`, `pechochar(3XCURSES)`, `attributes(5)`, `standards(5)`

**NAME** nl, nonl – enable/disable newline control

**SYNOPSIS** `cc [ flag... ] file... -I /usr/xpg4/include -L /usr/xpg4/lib \`  
`-R /usr/xpg4/lib -lcurses [ library... ]`

`c89 [ flag... ] file... -lcurses [ library... ]`

```
#include <curses.h>
int nl(void);
int nonl(void);
```

**DESCRIPTION** The `nl()` function enables the handling of newlines. The `nl()` function converts newline into carriage return and line feed on output and converts carriage return into newline on input. `nonl()` disables the handling of newlines.

The handling of newlines is initially enabled. Disabling the handling of newlines results in faster cursor motion since X/Open Curses can use the line-feed capability more efficiently.

**RETURN VALUES** On success, these functions return OK. Otherwise, they return ERR.

**ERRORS** None.

**ATTRIBUTES** See `attributes(5)` for descriptions of the following attributes:

| ATTRIBUTE TYPE      | ATTRIBUTE VALUE |
|---------------------|-----------------|
| Interface Stability | Standard        |
| MT-Level            | Unsafe          |

**SEE ALSO** `libcurses(3XCURSES)`, `attributes(5)`, `standards(5)`

## nodelay(3XCURSES)

**NAME** | nodelay – set blocking or non-blocking read

**SYNOPSIS** | 

```
cc [flag...] file... -I /usr/xpg4/include -L /usr/xpg4/lib \
-R /usr/xpg4/lib -lcurses [library...]

c89 [flag...] file... -lcurses [library...]

#include <curses.h>

int nodelay(WINDOW *win, bool bf);
```

**PARAMETERS** | *win* | Is a pointer to the window in which to enable non-blocking.

| *bf* | Is a Boolean expression.

**DESCRIPTION** | If enabled, (*bf* is TRUE), the `nodelay()` function causes `getch(3XCURSES)` to return ERR if no input is ready. When disabled, `getch()` blocks until a key is pressed.

**RETURN VALUES** | On success, the `nodelay()` function returns OK. Otherwise, it returns ERR.

**ERRORS** | None.

**ATTRIBUTES** | See `attributes(5)` for descriptions of the following attributes:

| ATTRIBUTE TYPE      | ATTRIBUTE VALUE |
|---------------------|-----------------|
| Interface Stability | Standard        |
| MT-Level            | Unsafe          |

**SEE ALSO** | `getch(3XCURSES)`, `halfdelay(3XCURSES)`, `libcurses(3XCURSES)`, `notimeout(3XCURSES)`, `attributes(5)`, `standards(5)`

| <b>NAME</b>          | noqiflush, qiflush – control flush of input and output on interrupt                                                                                                                                                                                      |                |                 |                     |          |          |        |
|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-----------------|---------------------|----------|----------|--------|
| <b>SYNOPSIS</b>      | <pre>cc [ flag... ] file... -I /usr/xpg4/include -L /usr/xpg4/lib \ -R /usr/xpg4/lib -lcurses [ library... ]  c89 [ flag... ] file... -lcurses [ library... ]  #include &lt;curses.h&gt;  void <b>noqiflush</b>(void);  void <b>qiflush</b>(void);</pre> |                |                 |                     |          |          |        |
| <b>DESCRIPTION</b>   | The <code>qiflush()</code> function enables the flushing of input and output queues when an interrupt, quit, or suspend character is sent to the terminal. The <code>noqiflush()</code> function disables this flushing.                                 |                |                 |                     |          |          |        |
| <b>RETURN VALUES</b> | These functions do not return a value.                                                                                                                                                                                                                   |                |                 |                     |          |          |        |
| <b>ERRORS</b>        | None                                                                                                                                                                                                                                                     |                |                 |                     |          |          |        |
| <b>ATTRIBUTES</b>    | See <code>attributes(5)</code> for descriptions of the following attributes:                                                                                                                                                                             |                |                 |                     |          |          |        |
|                      | <table border="1"> <thead> <tr> <th>ATTRIBUTE TYPE</th> <th>ATTRIBUTE VALUE</th> </tr> </thead> <tbody> <tr> <td>Interface Stability</td> <td>Standard</td> </tr> <tr> <td>MT-Level</td> <td>Unsafe</td> </tr> </tbody> </table>                         | ATTRIBUTE TYPE | ATTRIBUTE VALUE | Interface Stability | Standard | MT-Level | Unsafe |
| ATTRIBUTE TYPE       | ATTRIBUTE VALUE                                                                                                                                                                                                                                          |                |                 |                     |          |          |        |
| Interface Stability  | Standard                                                                                                                                                                                                                                                 |                |                 |                     |          |          |        |
| MT-Level             | Unsafe                                                                                                                                                                                                                                                   |                |                 |                     |          |          |        |
| <b>SEE ALSO</b>      | <code>flushinp(3XCURSES)</code> , <code>intrflush(3XCURSES)</code> , <code>libcurses(3XCURSES)</code> , <code>attributes(5)</code> , <code>standards(5)</code>                                                                                           |                |                 |                     |          |          |        |

notimeout(3XCURSES)

**NAME** notimeout, timeout, wtimeout – set timed blocking or non-blocking read

**SYNOPSIS**

```
cc [flag...] file... -I /usr/xpg4/include -L /usr/xpg4/lib \
-R /usr/xpg4/lib -lcurses [library...]

c89 [flag...] file... -lcurses [library...]

#include <curses.h>

int notimeout(WINDOW *win, bool bf);

void timeout(int delay);

void wtimeout(WINDOW win, int delay);
```

**PARAMETERS**

|              |                                                                |
|--------------|----------------------------------------------------------------|
| <i>win</i>   | Is a pointer to the window in which to set the timed blocking. |
| <i>bf</i>    | Is a Boolean expression.                                       |
| <i>delay</i> | Is the number of milliseconds to block or wait for input.      |

**DESCRIPTION**

If *bool* is TRUE, the notimeout() function disables a timer used by getch(3XCURSES) when handling multibyte function key sequences.

When *bool* is FALSE and keypad handling is enabled, a timer is set by getch() to handle bytes received that could be the beginning of a function key (for example, ESC). If the remainder of the sequence is not received before the time expires, the first byte is returned; otherwise, the value of the function key is returned. Subsequent calls to the getch() function will return the other bytes received for the incomplete key sequence.

The timeout() and wtimeout() functions set the length of time getch() waits for input for windows stdscr and win, respectively. These functions are similar to nodelay(3XCURSES) except the time to block or wait for input can be specified.

A negative *delay* causes the program to wait indefinitely for input; a *delay* of 0 returns ERR if no input is ready; and a positive *delay* blocks until input arrives or the time specified expires, (in which case, ERR is returned).

**RETURN VALUES** On success, the notimeout() function returns OK. Otherwise, it returns ERR.

The timeout() and wtimeout() functions do not return a value.

**ERRORS** None.

**ATTRIBUTES** See attributes(5) for descriptions of the following attributes:

| ATTRIBUTE TYPE      | ATTRIBUTE VALUE |
|---------------------|-----------------|
| Interface Stability | Standard        |

notimeout(3XCURSES)

| ATTRIBUTE TYPE | ATTRIBUTE VALUE |
|----------------|-----------------|
| MT-Level       | Unsafe          |

**SEE ALSO** getch(3XCURSES), halfdelay(3XCURSES), libcurses(3XCURSES),  
nodelay(3XCURSES), attributes(5), standards(5)

## overlay(3XCURSES)

|                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>NAME</b>          | overlay, overwrite – copy overlapped windows                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>SYNOPSIS</b>      | <pre>cc [ flag... ] file... -I /usr/xpg4/include -L /usr/xpg4/lib \ -R /usr/xpg4/lib -lcurses [ library... ]  c89 [ flag... ] file... -lcurses [ library... ]  #include &lt;curses.h&gt;  int overlay(const WINDOW *srcwin, WINDOW *dstwin);  int overwrite(const WINDOW *srcwin, WINDOW *dstwin);</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>PARAMETERS</b>    | <p><i>srcwin</i> Is a pointer to the source window to be copied.</p> <p><i>dstwin</i> Is a pointer to the destination window to be overlaid or overwritten.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>DESCRIPTION</b>   | <p>The <code>overwrite()</code> and <code>overlay()</code> functions overlay <i>srcwin</i> on top of <i>dstwin</i>. The <i>srcwin</i> and <i>dstwin</i> arguments do not have to be the same size; only text where the two windows overlap is copied.</p> <p>The <code>overwrite()</code> function copies characters as though a sequence of <code>win_wch(3XCURSES)</code> and <code>wadd_wch(3XCURSES)</code> were performed with the destination window's attributes and background attributes cleared.</p> <p>The <code>overlay()</code> function does the same thing, except that, whenever a character to be copied is the background character of the source window, <code>overlay()</code> does not copy the character but merely moves the destination cursor the width of the source background character.</p> <p>If any portion of the overlaying window border is not the first column of a multi-column character, then all the column positions will be replaced with the background character and rendition before the overlay is done. If the default background character is a multi-column character when this occurs, then these functions fail.</p> |
| <b>RETURN VALUES</b> | Upon successful completion, these functions return OK. Otherwise, they return ERR.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>ERRORS</b>        | No errors are defined.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>EXAMPLES</b>      | <p><b>EXAMPLE 1</b> Implement a pop-up dialog</p> <p>The following example demonstrates the use of <code>overwrite()</code> to implement a pop-up dialog box.</p> <pre>#include &lt;curses.h&gt; /*  * Pop-up a window on top of curscr. If row and/or col  * are -1 then that dimension will be centered within  * curscr. Return 0 for success or -1 if malloc( ) failed.  * Pass back the working window and the saved window for the  * pop-up. The saved window should not be modified.  */</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

**EXAMPLE 1** Implement a pop-up dialog (Continued)

```

int
popup(work, save, nrows, ncols, row, col)
WINDOW **work, **save;
int nrows, ncols, row, col;
{
 int mr, mc;
 getmaxyx(curscr, mr, mc);
 /* Windows are limited to the size of curscr. */
 if (mr < nrows)
 nrows = mr;
 if (mc < ncols)
 ncols = mc;
 /* Center dimensions. */
 if (row == -1)
 row = (mr-nrows)/2;
 if (col == -1)
 col = (mc-ncols)/2;
 /* The window must fit entirely in curscr. */
 if (mr < row+nrows)
 row = 0;
 if (mc < col+ncols)
 col = 0;
 *work = newwin(nrows, ncols, row, col);
 if (*work == NULL)
 return (-1);
 if ((*save = dupwin(*work)) == NULL) {
 delwin(*work);
 return (-1);
 }
 overwrite(curscr, *save);
 return (0);
}
/*
 * Restore the region covered by a pop-up window.
 * Delete the working window and the saved window.
 * This function is the complement to popup(). Return
 * 0 for success or -1 for an error.
 */
int
popdown(work, save)
WINDOW *work, *save;
{
 (void) wnoutrefresh(save);
 (void) delwin(save);
 (void) delwin(work);
 return (0);
}
/*
 * Compute the size of a dialog box that would fit around
 * the string.
 */
void
dialsize(str, nrows, ncols)
char *str;

```

**EXAMPLE 1** Implement a pop-up dialog *(Continued)*

```

int *nrows, *ncols;
{
 int rows, cols, col;
 for (rows = 1, cols = col = 0; *str != '\0'; ++str) {
 if (*str == '\n') {
 if (cols < col)
 cols = col;
 col = 0;
 ++rows;
 } else {
 ++col;
 }
 }
 if (cols < col)
 cols = col;
 *nrows = rows;
 *ncols = cols;
}
/*
 * Write a string into a dialog box.
 */
void
dialfill(w, s)
WINDOW *w;
char *s;
{
 int row;
 (void) wmove(w, 1, 1);
 for (row = 1; *s != '\0'; ++s) {
 (void) waddch(w, *((unsigned char*) s));
 if (*s == '\n')
 wmove(w, ++row, 1);
 }
 box(w, 0, 0);
}
void
dialog(str)
char *str;
{
 WINDOW *work, *save;
 int nrows, ncols, row, col;
 /* Figure out size of window. */
 dialsize(str, &nrows, &ncols);
 /* Create a centered working window with extra */
 /* room for a border. */
 (void) popup(&work, &save, nrows+2, ncols+2, -1, -1);
 /* Write text into the working window. */
 dialfill(work, str);
 /* Pause. Remember that wgetch() will do a wrefresh() */
 /* for us. */
 (void) wgetch(work);
 /* Restore curscr and free windows. */
 (void) popdown(work, save);
 /* Redraw curscr to remove window from physical screen. */
}

```

**EXAMPLE 1** Implement a pop-up dialog *(Continued)*

```
(void) douupdate();
}
```

**ATTRIBUTES** See `attributes(5)` for descriptions of the following attributes:

| ATTRIBUTE TYPE      | ATTRIBUTE VALUE |
|---------------------|-----------------|
| Interface Stability | Standard        |
| MT-Level            | Unsafe          |

**SEE ALSO** `copywin(3XCURSES)`, `libcurses(3XCURSES)`, `wadd_wch(3XCURSES)`, `win_wch(3XCURSES)`, `attributes(5)`, `standards(5)`

## panel\_above(3CURSES)

| <b>NAME</b>          | panel_above, panel_below – panels deck traversal primitives                                                                                                                                                                                                                                                                                                                                                             |                |                 |          |        |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-----------------|----------|--------|
| <b>SYNOPSIS</b>      | <pre>cc [ flag ... ] file ... -lpanel -lcurses [ library .. ] #include &lt;panel.h&gt;  PANEL *panel_above (PANEL *panel) ; PANEL *panel_below (PANEL *panel) ;</pre>                                                                                                                                                                                                                                                   |                |                 |          |        |
| <b>DESCRIPTION</b>   | <p>panel_above() returns a pointer to the panel just above <i>panel</i>, or NULL if <i>panel</i> is the top panel. panel_below() returns a pointer to the panel just below <i>panel</i>, or NULL if <i>panel</i> is the bottom panel.</p> <p>If NULL is passed for <i>panel</i>, panel_above() returns a pointer to the bottom panel in the deck, and panel_below() returns a pointer to the top panel in the deck.</p> |                |                 |          |        |
| <b>RETURN VALUES</b> | NULL is returned if an error occurs.                                                                                                                                                                                                                                                                                                                                                                                    |                |                 |          |        |
| <b>ATTRIBUTES</b>    | See attributes(5) for descriptions of the following attributes:                                                                                                                                                                                                                                                                                                                                                         |                |                 |          |        |
|                      | <table border="1"><thead><tr><th>ATTRIBUTE TYPE</th><th>ATTRIBUTE VALUE</th></tr></thead><tbody><tr><td>MT-Level</td><td>Unsafe</td></tr></tbody></table>                                                                                                                                                                                                                                                               | ATTRIBUTE TYPE | ATTRIBUTE VALUE | MT-Level | Unsafe |
| ATTRIBUTE TYPE       | ATTRIBUTE VALUE                                                                                                                                                                                                                                                                                                                                                                                                         |                |                 |          |        |
| MT-Level             | Unsafe                                                                                                                                                                                                                                                                                                                                                                                                                  |                |                 |          |        |
| <b>SEE ALSO</b>      | curses(3CURSES), panels(3CURSES), attributes(5)                                                                                                                                                                                                                                                                                                                                                                         |                |                 |          |        |
| <b>NOTES</b>         | <p>These routines allow traversal of the deck of currently visible panels.</p> <p>The header &lt;panel.h&gt; automatically includes the header &lt;curses.h&gt;.</p>                                                                                                                                                                                                                                                    |                |                 |          |        |

panel\_move(3CURSES)

**NAME** panel\_move, move\_panel – move a panels window on the virtual screen

**SYNOPSIS** `cc [ flag ... ] file ... -lpanel -lcurses [ library .. ]`  
`#include <panel.h>`

`int move_panel(PANEL *panel, int starty, int startx);`

**DESCRIPTION** `move_panel()` moves the `curses` window associated with `panel` so that its upper left-hand corner is at `starty, startx`. See usage note, below.

**RETURN VALUES** OK is returned if the routine completes successfully, otherwise ERR is returned.

**ATTRIBUTES** See `attributes(5)` for descriptions of the following attributes:

| ATTRIBUTE TYPE | ATTRIBUTE VALUE |
|----------------|-----------------|
| MT-Level       | Unsafe          |

**SEE ALSO** `curses(3CURSES)`, `panel_update(3CURSES)`, `panels(3CURSES)`, `attributes(5)`

**NOTES** For `panels` windows, use `move_panel()` instead of the `mvwin()` `curses` routine. Otherwise, `update_panels()` will not properly update the virtual screen.

The header `<panel.h>` automatically includes the header `<curses.h>`.

panel\_new(3CURSES)

**NAME** panel\_new, new\_panel, del\_panel – create and destroy panels

**SYNOPSIS**

```
cc [flag ...] file ... -lpanel -lcurses [library ..]
#include <panel.h>

PANEL *new_panel (WINDOW *win) ;
int del_panel (PANEL *panel) ;
```

**DESCRIPTION** new\_panel () creates a new panel associated with *win* and returns the panel pointer. The new panel is placed on top of the panel deck.

del\_panel () destroys *panel*, but not its associated window.

**RETURN VALUES** new\_panel () returns NULL if an error occurs.

del\_win () returns OK if successful, ERR otherwise.

**ATTRIBUTES** See attributes(5) for descriptions of the following attributes:

| ATTRIBUTE TYPE | ATTRIBUTE VALUE |
|----------------|-----------------|
| MT-Level       | Unsafe          |

**SEE ALSO** curses(3CURSES), panel\_update(3CURSES), panels(3CURSES), attributes(5)

**NOTES** The header <panel.h> automatically includes the header <curses.h>.

|                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|---------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>NAME</b>               | panels – character based panels package                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>SYNOPSIS</b>           | <code>#include &lt;panel.h&gt;</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>DESCRIPTION</b>        | <p>The panel library is built using the <code>curses</code> library, and any program using <code>panels</code> routines must call one of the <code>curses</code> initialization routines such as <code>initscr</code>. A program using these routines must be compiled with <code>-lpanel</code> and <code>-lcurses</code> on the <code>cc</code> command line.</p> <p>The <code>panels</code> package gives the applications programmer a way to have depth relationships between <code>curses</code> windows; a <code>curses</code> window is associated with every panel. The <code>panels</code> routines allow <code>curses</code> windows to overlap without making visible the overlapped portions of underlying windows. The initial <code>curses</code> window, <code>stdscr</code>, lies beneath all panels. The set of currently visible panels is the <i>deck</i> of panels.</p> <p>The <code>panels</code> package allows the applications programmer to create panels, fetch and set their associated windows, shuffle panels in the deck, and manipulate panels in other ways.</p> |
| <b>Routine Name Index</b> | <p>The following table lists each <code>panels</code> routine and the name of the manual page on which it is described.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

| panels Routine Name            | Manual Page Name                    |
|--------------------------------|-------------------------------------|
| <code>bottom_panel</code>      | <code>panel_top(3CURSES)</code>     |
| <code>del_panel</code>         | <code>panel_new(3CURSES)</code>     |
| <code>hide_panel</code>        | <code>panel_show(3CURSES)</code>    |
| <code>move_panel</code>        | <code>panel_move(3CURSES)</code>    |
| <code>new_panel</code>         | <code>panel_new(3CURSES)</code>     |
| <code>panel_above</code>       | <code>panel_above(3CURSES)</code>   |
| <code>panel_below</code>       | <code>panel_above(3CURSES)</code>   |
| <code>panel_hidden</code>      | <code>panel_show(3CURSES)</code>    |
| <code>panel_userptr</code>     | <code>panel_userptr(3CURSES)</code> |
| <code>panel_window</code>      | <code>panel_window(3CURSES)</code>  |
| <code>replace_panel</code>     | <code>panel_window(3CURSES)</code>  |
| <code>set_panel_userptr</code> | <code>panel_userptr(3CURSES)</code> |
| <code>show_panel</code>        | <code>panel_show(3CURSES)</code>    |
| <code>top_panel</code>         | <code>panel_top(3CURSES)</code>     |
| <code>update_panels</code>     | <code>panel_update(3CURSES)</code>  |

panels(3CURSES)

**RETURN VALUES** Each `panels` routine that returns a pointer to an object returns `NULL` if an error occurs. Each panel routine that returns an integer, returns `OK` if it executes successfully and `ERR` if it does not.

**ATTRIBUTES** See `attributes(5)` for descriptions of the following attributes:

| ATTRIBUTE TYPE | ATTRIBUTE VALUE |
|----------------|-----------------|
| MT-Level       | Unsafe          |

**SEE ALSO** `curses(3CURSES)`, `attributes(5)` and 3X pages whose names begin “panel\_” for detailed routine descriptions.

**NOTES** The header `<panel.h>` automatically includes the header `<curses.h>`.

| <b>NAME</b>          | panel_show, show_panel, hide_panel, panel_hidden – panels deck manipulation routines                                                                                                                                                                                                                                                                                                     |                |                 |          |        |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-----------------|----------|--------|
| <b>SYNOPSIS</b>      | <pre>cc [ flag ... ] file ... -lpanel -lcurses [ library .. ] #include &lt;panel.h&gt;  int show_panel (PANEL *panel) ; int hide_panel (PANEL *panel) ; int panel_hidden (PANEL *panel) ;</pre>                                                                                                                                                                                          |                |                 |          |        |
| <b>DESCRIPTION</b>   | <p>show_panel () makes <i>panel</i>, previously hidden, visible and places it on top of the deck of panels.</p> <p>hide_panel () removes <i>panel</i> from the panel deck and, thus, hides it from view. The internal data structure of the panel is retained.</p> <p>panel_hidden () returns TRUE (1) or FALSE (0) indicating whether or not <i>panel</i> is in the deck of panels.</p> |                |                 |          |        |
| <b>RETURN VALUES</b> | show_panel () and hide_panel () return the integer OK upon successful completion or ERR upon error.                                                                                                                                                                                                                                                                                      |                |                 |          |        |
| <b>ATTRIBUTES</b>    | See attributes(5) for descriptions of the following attributes:                                                                                                                                                                                                                                                                                                                          |                |                 |          |        |
|                      | <table border="1"> <thead> <tr> <th>ATTRIBUTE TYPE</th> <th>ATTRIBUTE VALUE</th> </tr> </thead> <tbody> <tr> <td>MT-Level</td> <td>Unsafe</td> </tr> </tbody> </table>                                                                                                                                                                                                                   | ATTRIBUTE TYPE | ATTRIBUTE VALUE | MT-Level | Unsafe |
| ATTRIBUTE TYPE       | ATTRIBUTE VALUE                                                                                                                                                                                                                                                                                                                                                                          |                |                 |          |        |
| MT-Level             | Unsafe                                                                                                                                                                                                                                                                                                                                                                                   |                |                 |          |        |
| <b>SEE ALSO</b>      | curses(3CURSES), panel_update(3CURSES), panels(3CURSES), attributes(5)                                                                                                                                                                                                                                                                                                                   |                |                 |          |        |
| <b>NOTES</b>         | The header <panel.h> automatically includes the header <curses.h>.                                                                                                                                                                                                                                                                                                                       |                |                 |          |        |

panel\_top(3CURSES)

**NAME** panel\_top, top\_panel, bottom\_panel – panels deck manipulation routines

**SYNOPSIS**

```
cc [flag ...] file ... -lpanel -lcurses [library ..]
#include <panel.h>

int top_panel (PANEL *panel) ;
int bottom_panel (PANEL *panel) ;
```

**DESCRIPTION** top\_panel () pulls *panel* to the top of the desk of panels. It leaves the size, location, and contents of its associated window unchanged.

bottom\_panel () puts *panel* at the bottom of the deck of panels. It leaves the size, location, and contents of its associated window unchanged.

**RETURN VALUES** All of these routines return the integer OK upon successful completion or ERR upon error.

**ATTRIBUTES** See attributes(5) for descriptions of the following attributes:

| ATTRIBUTE TYPE | ATTRIBUTE VALUE |
|----------------|-----------------|
| MT-Level       | Unsafe          |

**SEE ALSO** curses(3CURSES), panel\_update(3CURSES), panels(3CURSES), attributes(5)

**NOTES** The header <panel.h> automatically includes the header <curses.h>.

panel\_update(3CURSES)

**NAME** panel\_update, update\_panels – panels virtual screen refresh routine

**SYNOPSIS**

```
cc [flag ...] file ... -lpanel -lcurses [library ..]
#include <panel.h>

void update_panels(void);
```

**DESCRIPTION** update\_panels() refreshes the virtual screen to reflect the depth relationships between the panels in the deck. The user must use the curses library call doupdate() (see curs\_refresh(3CURSES)) to refresh the physical screen.

**ATTRIBUTES** See attributes(5) for descriptions of the following attributes:

| ATTRIBUTE TYPE | ATTRIBUTE VALUE |
|----------------|-----------------|
| MT-Level       | Unsafe          |

**SEE ALSO** curs\_refresh(3CURSES), curses(3CURSES), panels(3CURSES), attributes(5)

**NOTES** The header <panel.h> automatically includes the header <curses.h>.

## panel\_userptr(3CURSES)

| <b>NAME</b>          | panel_userptr, set_panel_userptr – associate application data with a panels panel                                                                                                                                                     |                |                 |          |        |
|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-----------------|----------|--------|
| <b>SYNOPSIS</b>      | <pre>cc [ flag ... ] file ... -lpanel -lcurses [ library .. ] #include &lt;panel.h&gt;  int set_panel_userptr(PANEL *panel, char *ptr); char * panel_userptr(PANEL *panel);</pre>                                                     |                |                 |          |        |
| <b>DESCRIPTION</b>   | <p>Each panel has a user pointer available for maintaining relevant information.</p> <p>set_panel_userptr() sets the user pointer of <i>panel</i> to <i>ptr</i>.</p> <p>panel_userptr() returns the user pointer of <i>panel</i>.</p> |                |                 |          |        |
| <b>RETURN VALUES</b> | <p>set_panel_userptr returns OK if successful, ERR otherwise.</p> <p>panel_userptr returns NULL if there is no user pointer assigned to <i>panel</i>.</p>                                                                             |                |                 |          |        |
| <b>ATTRIBUTES</b>    | See attributes(5) for descriptions of the following attributes:                                                                                                                                                                       |                |                 |          |        |
|                      | <table border="1"><thead><tr><th>ATTRIBUTE TYPE</th><th>ATTRIBUTE VALUE</th></tr></thead><tbody><tr><td>MT-Level</td><td>Unsafe</td></tr></tbody></table>                                                                             | ATTRIBUTE TYPE | ATTRIBUTE VALUE | MT-Level | Unsafe |
| ATTRIBUTE TYPE       | ATTRIBUTE VALUE                                                                                                                                                                                                                       |                |                 |          |        |
| MT-Level             | Unsafe                                                                                                                                                                                                                                |                |                 |          |        |
| <b>SEE ALSO</b>      | curses(3CURSES), panels(3CURSES), attributes(5)                                                                                                                                                                                       |                |                 |          |        |
| <b>NOTES</b>         | The header <panel.h> automatically includes the header <curses.h>.                                                                                                                                                                    |                |                 |          |        |

**NAME** panel\_window, replace\_panel – get or set the current window of a panels panel

**SYNOPSIS** `cc [ flag ... ] file ... -lpanel -lcurses [ library .. ]`  
`#include <panel.h>`

`WINDOW *panel_window(PANEL *panel);`  
`int replace_panel(PANEL *panel, WINDOW *win);`

**DESCRIPTION** panel\_window() returns a pointer to the window of *panel*.  
 replace\_panel() replaces the current window of *panel* with *win*.

**RETURN VALUES** panel\_window() returns NULL on failure.  
 replace\_panel() returns OK on successful completion, ERR otherwise.

**ATTRIBUTES** See attributes(5) for descriptions of the following attributes:

| ATTRIBUTE TYPE | ATTRIBUTE VALUE |
|----------------|-----------------|
| MT-Level       | Unsafe          |

**SEE ALSO** curses(3CURSES), panels(3CURSES), attributes(5)

**NOTES** The header <panel.h> automatically includes the header <curses.h>.

pechochar(3XCURSES)

**NAME** | pechochar, pecho\_wchar – add character and refresh window

**SYNOPSIS** | `cc [ flag... ] file... -I /usr/xpg4/include -L /usr/xpg4/lib \`  
`-R /usr/xpg4/lib -lcurses [ library... ]`

**SYNOPSIS** | `c89 [ flag... ] file... -lcurses [ library... ]`

**SYNOPSIS** | `#include <curses.h>`

**SYNOPSIS** | `int pechochar(WINDOW *pad, chtype ch);`

**SYNOPSIS** | `int pecho_wchar(WINDOW *pad, const chtype *wch);`

**PARAMETERS** | *pad* | Is a pointer to the pad in which the character is to be added.

**PARAMETERS** | *ch* | Is a pointer to the character to be written to the pad.

**PARAMETERS** | *wch* | Is a pointer to the complex character to be written to the pad.

**DESCRIPTION** | The pechochar() function is equivalent to calling waddch(3XCURSES) followed by a call to prefresh(3XCURSES). The pecho\_wchar() function is equivalent to calling wadd\_wch(3XCURSES) followed by a call to prefresh(). prefresh() reuses the last position of the pad on the screen for its parameters.

**RETURN VALUES** | On success, these functions return OK. Otherwise, they return ERR.

**ERRORS** | None.

**ATTRIBUTES** | See attributes(5) for descriptions of the following attributes:

| ATTRIBUTE TYPE      | ATTRIBUTE VALUE |
|---------------------|-----------------|
| Interface Stability | Standard        |
| MT-Level            | Unsafe          |

**SEE ALSO** | add\_wch(3XCURSES), addch(3XCURSES), libcurses(3XCURSES), newpad(3XCURSES), attributes(5), standards(5)

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>NAME</b>        | plot, arc, box, circle, closepl, closevt, cont, erase, label, line, linemod, move, openpl, openvt, point, space – graphics interface                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>SYNOPSIS</b>    | <pre>cc [ flag ... ] file ... -lplot [ library... ] #include &lt;plot.h&gt;  void <b>arc</b>(short x0, short y0, short x1, short y1, short x2, short         y2);  void <b>box</b>(short x0, short y0, short x1, short y1);  void <b>circle</b>(short x, short y, short r);  void <b>closepl</b>();  void <b>closevt</b>();  void <b>cont</b>(short x, short y);  void <b>erase</b>();  void <b>label</b>(char *s);  void <b>line</b>(short x0, short y0, short x1, short y1);  void <b>linemod</b>(char *s);  void <b>move</b>(short x, short y);  void <b>openpl</b>();  void <b>openvt</b>();  void <b>point</b>(short x, short y);  void <b>space</b>(short x0, short y0, short x1, short y1);</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>DESCRIPTION</b> | <p>These functions generate graphics output for a set of output devices. The format of the output is dependent upon which link editor option is used when the program is compiled and linked (see Link Editor).</p> <p>The term "current point" refers to the current setting for the <math>x</math> and <math>y</math> coordinates.</p> <p>The <code>arc()</code> function specifies a circular arc. The coordinates <math>(x0, y0)</math> specify the center of the arc. The coordinates <math>(x1, y1)</math> specify the starting point of the arc. The coordinates <math>(x2, y2)</math> specify the end point of the circular arc.</p> <p>The <code>box()</code> function specifies a rectangle with coordinates <math>(x0, y0)</math>, <math>(x0, y1)</math>, <math>(x1, y0)</math>, and <math>(x1, y1)</math>. The current point is set to <math>(x1, y1)</math>.</p> <p>The <code>circle()</code> function specifies a circle with a center at the coordinates <math>(x, y)</math> and a radius of <math>r</math>.</p> <p>The <code>closevt()</code> and <code>closepl()</code> functions flush the output.</p> <p>The <code>cont()</code> function specifies a line beginning at the current point and ending at the coordinates <math>(x, y)</math>. The current point is set to <math>(x, y)</math>.</p> |

## plot(3PLOT)

The `erase()` function starts another frame of output.

The `label()` function places the null terminated string `s` so that the first character falls on the current point. The string is then terminated by a NEWLINE character.

The `line()` function draws a line starting at the coordinates  $(x_0, y_0)$  and ending at the coordinates  $(x_1, y_1)$ . The current point is set to  $(x_1, y_1)$ .

The `linemod()` function specifies the style for drawing future lines. `s` may contain one of the following: `dotted`, `solid`, `longdashed`, `shortdashed`, or `dotdashed`.

The `move()` function sets the current point to the coordinates  $(x, y)$ .

The `openpl()` or `openvt()` function must be called to open the device before any other `plot` functions are called.

The `point()` function plots the point given by the coordinates  $(x, y)$ . The current point is set to  $(x, y)$ .

The `space()` function specifies the size of the plotting area. The plot will be reduced or enlarged as necessary to fit the area specified. The coordinates  $(x_0, y_0)$  specify the lower left hand corner of the plotting area. The coordinates  $(x_1, y_1)$  specify the upper right hand corner of the plotting area.

**Link Editor** Various flavors of these functions exist for different output devices. They are obtained by using the following `ld(1)` options:

|                     |                                                                                                        |
|---------------------|--------------------------------------------------------------------------------------------------------|
| <code>-lplot</code> | device-independent graphics stream on standard output in the format described in <code>plot(4B)</code> |
| <code>-l300</code>  | GSI 300 terminal                                                                                       |
| <code>-l300s</code> | GSI 300S terminal                                                                                      |
| <code>-l4014</code> | Tektronix 4014 terminal                                                                                |
| <code>-l450</code>  | GSI 450 terminal                                                                                       |
| <code>-lvt0</code>  |                                                                                                        |

**FILES**

|                                            |                      |
|--------------------------------------------|----------------------|
| <code>/usr/lib/libplot.a</code>            | archive library      |
| <code>/usr/lib/libplot.so.1</code>         | shared object        |
| <code>/usr/lib/sparcv9/libplot.so.1</code> | 64-bit shared object |
| <code>/usr/lib/lib300.a</code>             | archive library      |
| <code>/usr/lib/lib300.so.1</code>          | shared object        |

```

/usr/lib/sparcv9/lib300.so.1
 64-bit shared object
/usr/lib/lib300s.a
 archive library
/usr/lib/lib300s.so.1
 shared object
/usr/lib/sparcv9/lib300s.so.1
 64-bit shared object
/usr/lib/lib4014.a
 archive library
/usr/lib/lib4014.so.1
 shared object
/usr/lib/sparcv9/lib4014.so.1
 64-bit shared object
/usr/lib/lib450.a
 archive library
/usr/lib/lib450.so.1
 shared object
/usr/lib/sparcv9/lib450.so.1
 64-bit shared object
/usr/lib/libvt0.a
 archive library
/usr/lib/libvt0.so.1
 shared object
/usr/lib/sparcv9/libvt0.so.1
 64-bit shared object

```

**ATTRIBUTES** See `attributes(5)` for descriptions of the following attributes:

| ATTRIBUTE TYPE | ATTRIBUTE VALUE |
|----------------|-----------------|
| MT-Level       | Unsafe          |

**SEE ALSO** `graph(1)`, `ld(1)`, `libplot(3LIB)`, `plot(4B)`, `attributes(5)`

## putp(3XCURSES)

|                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>NAME</b>          | putp, tputs – apply padding information and output string                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>SYNOPSIS</b>      | <pre>cc [ flag... ] file... -I /usr/xpg4/include -L /usr/xpg4/lib \ -R /usr/xpg4/lib -lcurses [ library... ]  c89 [ flag... ] file... -lcurses [ library... ]  #include &lt;curses.h&gt;  int putp(const char *str);  int tputs(const char *str, int affcnt, int (*putfunc) (int));</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>PARAMETERS</b>    | <p><i>str</i> Is a pointer to a terminfo variable or return value from tgetstr(3XCURSES), tgoto(3XCURSES), tigetstr(3XCURSES), or tparm(3XCURSES).</p> <p><i>affcnt</i> Is the number of lines affected, or 1 if not relevant.</p> <p><i>putfunc</i> Is the output function.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>DESCRIPTION</b>   | <p>The putp() and tputs() functions are low-level functions used to deal directly with the terminfo database. The use of appropriate X/Open Curses functions is recommended for most situations.</p> <p>The tputs() function adds padding information and then outputs <i>str</i>. <i>str</i> must be a terminfo string variable or the result value from tgetstr(), tgoto(), tigetstr(), or tparm(). The tputs() function replaces the padding specification (if one exists) with enough characters to produce the specified delay. Characters are output one at a time to <i>putfunc</i>, a user-specified function similar to putchar(3C).</p> <p>The putp() function calls tputs() as follows:</p> <pre>tputs(str, 1, putchar)</pre> |
| <b>RETURN VALUES</b> | On success, these functions return OK.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>ERRORS</b>        | None.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>USAGE</b>         | The output of putp() goes to stdout, not to the file descriptor, <i>fdes</i> , specified in setupterm(3XCURSES).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>ATTRIBUTES</b>    | See attributes(5) for descriptions of the following attributes:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

| ATTRIBUTE TYPE      | ATTRIBUTE VALUE |
|---------------------|-----------------|
| Interface Stability | Standard        |
| MT-Level            | Unsafe          |

putp(3XCURSES)

**SEE ALSO** libcurses(3XCURSES), putchar(3C), setupterm(3XCURSES),  
tgetent(3XCURSES), tigetflag(3XCURSES), terminfo(4), attributes(5),  
standards(5)

redrawwin(3XCURSES)

**NAME** redrawwin, wredrawln – redraw screen or portion of screen

**SYNOPSIS** `cc [ flag... ] file... -I /usr/xpg4/include -L /usr/xpg4/lib \`  
`-R /usr/xpg4/lib -lcurses [ library... ]`

`c89 [ flag... ] file... -lcurses [ library... ]`

```
#include <curses.h>
int redrawwin(WINDOW *win);
int wredrawln(WINDOW *win, int beg_line, int num_lines);
```

**PARAMETERS** *win* Is a pointer to the window in which to redraw.  
*beg\_line* Is the first line to redraw.  
*num\_lines* Is the number of lines to redraw.

**DESCRIPTION** The `redrawwin()` and `wredrawln()` functions force portions of a window to be redrawn to the terminal when the next refresh operation is performed.

The `redrawwin()` function forces the entire window *win* to be redrawn, while the `wredrawln()` function forces only *num\_lines* lines starting with *beg\_line* to be redrawn. Normally, refresh operations use optimization methods to reduce the actual amount of the screen to redraw based on the current screen contents. These functions tell the refresh operations not to attempt any optimization when redrawing the indicated areas.

These functions are useful when the data that exists on the screen is believed to be corrupt and for applications such as screen editors that redraw portions of the screen.

**RETURN VALUES** On success, these functions return OK. Otherwise, they return ERR.

**ERRORS** None.

**ATTRIBUTES** See `attributes(5)` for descriptions of the following attributes:

| ATTRIBUTE TYPE      | ATTRIBUTE VALUE |
|---------------------|-----------------|
| Interface Stability | Standard        |
| MT-Level            | Unsafe          |

**SEE ALSO** `doupdate(3XCURSES)`, `libcurses(3XCURSES)`, `attributes(5)`, `standards(5)`

**NAME** resetty, savetty – restore/save terminal modes

**SYNOPSIS** `cc [ flag... ] file... -I /usr/xpg4/include -L /usr/xpg4/lib \`  
`-R /usr/xpg4/lib -lcurses [ library... ]`

`c89 [ flag... ] file... -lcurses [ library... ]`

```
#include <curses.h>
int resetty(void);
int savetty(void);
```

**DESCRIPTION** The savetty() and resetty() functions save and restore the terminal state, respectively. The savetty() function saves the current state in a buffer; the resetty() function restores the state to that stored in the buffer at the time of the last savetty() call.

**RETURN VALUES** On success, these functions return OK. Otherwise, they return ERR.

**ERRORS** None.

**ATTRIBUTES** See attributes(5) for descriptions of the following attributes:

| ATTRIBUTE TYPE      | ATTRIBUTE VALUE |
|---------------------|-----------------|
| Interface Stability | Standard        |
| MT-Level            | Unsafe          |

**SEE ALSO** libcurses(3XCURSES), attributes(5), standards(5)

## riponline(3XCURSES)

| <b>NAME</b>          | riponline – reserve screen line for dedicated purpose                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                |                                                                                                                                                                  |                     |                                                                  |            |                                                           |              |                                                                                |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|------------------------------------------------------------------|------------|-----------------------------------------------------------|--------------|--------------------------------------------------------------------------------|
| <b>SYNOPSIS</b>      | <pre>cc [ flag... ] file... -I /usr/xpg4/include -L /usr/xpg4/lib \ -R /usr/xpg4/lib -lcurses [ library... ]  c89 [ flag... ] file... -lcurses [ library... ]  #include &lt;curses.h&gt;  int <b>riponline</b>(int <i>line</i>, int (*init)(WINDOW *win, int <i>width</i>));</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                |                |                                                                                                                                                                  |                     |                                                                  |            |                                                           |              |                                                                                |
| <b>PARAMETERS</b>    | <table><tr><td><i>line</i></td><td>determines whether the screen line being reserved comes from the top of <code>stdscr</code> (<i>line</i> is positive) or the bottom (<i>line</i> is negative).</td></tr><tr><td><i>init</i></td><td>Is a pointer to a function that initializes the one-line window.</td></tr><tr><td><i>win</i></td><td>Is a pointer to one-line window created by this function.</td></tr><tr><td><i>width</i></td><td>Is the number of columns in the window pointed to by the <i>win</i> parameter.</td></tr></table>                                                                                                                                                                      | <i>line</i>    | determines whether the screen line being reserved comes from the top of <code>stdscr</code> ( <i>line</i> is positive) or the bottom ( <i>line</i> is negative). | <i>init</i>         | Is a pointer to a function that initializes the one-line window. | <i>win</i> | Is a pointer to one-line window created by this function. | <i>width</i> | Is the number of columns in the window pointed to by the <i>win</i> parameter. |
| <i>line</i>          | determines whether the screen line being reserved comes from the top of <code>stdscr</code> ( <i>line</i> is positive) or the bottom ( <i>line</i> is negative).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                |                                                                                                                                                                  |                     |                                                                  |            |                                                           |              |                                                                                |
| <i>init</i>          | Is a pointer to a function that initializes the one-line window.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                |                                                                                                                                                                  |                     |                                                                  |            |                                                           |              |                                                                                |
| <i>win</i>           | Is a pointer to one-line window created by this function.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                |                                                                                                                                                                  |                     |                                                                  |            |                                                           |              |                                                                                |
| <i>width</i>         | Is the number of columns in the window pointed to by the <i>win</i> parameter.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                |                                                                                                                                                                  |                     |                                                                  |            |                                                           |              |                                                                                |
| <b>DESCRIPTION</b>   | <p>The <code>riponline()</code> function reserves a screen line as a one line window.</p> <p>To use this function, it must be called before you call <code>initscr(3XCURSES)</code> or <code>newterm(3XCURSES)</code>. When <code>initscr()</code> or <code>newterm()</code> is called, so is the function pointed to by <code>init</code>. The function pointed to by <code>init</code> takes two arguments: a pointer to the one-line window and the number of columns in that window. This function cannot use the <code>LINES</code> or <code>COLS</code> variables and cannot call <code>wrefresh(3XCURSES)</code> or <code>doupdate(3XCURSES)</code>, but may call <code>wnoutrefresh(3XCURSES)</code>.</p> |                |                                                                                                                                                                  |                     |                                                                  |            |                                                           |              |                                                                                |
| <b>RETURN VALUES</b> | The <code>riponline()</code> function always returns OK.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                |                                                                                                                                                                  |                     |                                                                  |            |                                                           |              |                                                                                |
| <b>ERRORS</b>        | None.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                |                                                                                                                                                                  |                     |                                                                  |            |                                                           |              |                                                                                |
| <b>ATTRIBUTES</b>    | See <code>attributes(5)</code> for descriptions of the following attributes:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                |                                                                                                                                                                  |                     |                                                                  |            |                                                           |              |                                                                                |
|                      | <table border="1"><thead><tr><th>ATTRIBUTE TYPE</th><th>ATTRIBUTE VALUE</th></tr></thead><tbody><tr><td>Interface Stability</td><td>Standard</td></tr><tr><td>MT-Level</td><td>Unsafe</td></tr></tbody></table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | ATTRIBUTE TYPE | ATTRIBUTE VALUE                                                                                                                                                  | Interface Stability | Standard                                                         | MT-Level   | Unsafe                                                    |              |                                                                                |
| ATTRIBUTE TYPE       | ATTRIBUTE VALUE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                |                                                                                                                                                                  |                     |                                                                  |            |                                                           |              |                                                                                |
| Interface Stability  | Standard                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                |                                                                                                                                                                  |                     |                                                                  |            |                                                           |              |                                                                                |
| MT-Level             | Unsafe                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                |                                                                                                                                                                  |                     |                                                                  |            |                                                           |              |                                                                                |
| <b>SEE ALSO</b>      | <code>doupdate(3XCURSES)</code> , <code>initscr(3XCURSES)</code> , <code>libcurses(3XCURSES)</code> , <code>slk_attroff(3XCURSES)</code> , <code>attributes(5)</code> , <code>standards(5)</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                |                                                                                                                                                                  |                     |                                                                  |            |                                                           |              |                                                                                |

| <b>NAME</b>          | scr_dump, scr_init, scr_restore, scr_set – write screen contents to/from a file                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                |                 |                     |          |          |        |
|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-----------------|---------------------|----------|----------|--------|
| <b>SYNOPSIS</b>      | <pre>cc [ flag... ] file... -I /usr/xpg4/include -L /usr/xpg4/lib \ -R /usr/xpg4/lib -lcurses [ library... ]  c89 [ flag... ] file... -lcurses [ library... ]  #include &lt;curses.h&gt;  int scr_dump(const char *filename); int scr_init(const char *filename); int scr_restore(const char *filename); int scr_set(const char *filename);</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                |                 |                     |          |          |        |
| <b>PARAMETERS</b>    | <i>filename</i> Is a pointer to the file in which screen contents are written.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                |                 |                     |          |          |        |
| <b>DESCRIPTION</b>   | <p>These function perform input/output functions on a screen basis.</p> <p>The <code>scr_dump()</code> function writes the contents of the virtual screen, <code>curscr</code>, to <i>filename</i>.</p> <p>The <code>scr_restore()</code> function reads the contents of <i>filename</i> from <code>curscr</code> (which must have been written with <code>scr_dump()</code>). The next refresh operation restores the screen to the way it looks in <i>filename</i>.</p> <p>The <code>scr_init()</code> function reads the contents of <i>filename</i> and uses those contents to initialize the X/Open Curses data structures to what is actually on screen. The next refresh operation bases its updates on this data, unless the terminal has been written to since <i>filename</i> was saved or the terminfo capabilities <code>rmcup</code> and <code>nrrmc</code> are defined for the current terminal.</p> <p>The <code>scr_set()</code> function combines <code>scr_restore()</code> and <code>scr_init()</code>. It informs the program that the contents of the file <i>filename</i> are what is currently on the screen and that the program wants those contents on the screen.</p> |                |                 |                     |          |          |        |
| <b>RETURN VALUES</b> | On success, these functions return OK. Otherwise, they return ERR.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                |                 |                     |          |          |        |
| <b>ERRORS</b>        | None.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                |                 |                     |          |          |        |
| <b>ATTRIBUTES</b>    | See <code>attributes(5)</code> for descriptions of the following attributes:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                |                 |                     |          |          |        |
|                      | <table border="1"> <thead> <tr> <th>ATTRIBUTE TYPE</th> <th>ATTRIBUTE VALUE</th> </tr> </thead> <tbody> <tr> <td>Interface Stability</td> <td>Standard</td> </tr> <tr> <td>MT-Level</td> <td>Unsafe</td> </tr> </tbody> </table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | ATTRIBUTE TYPE | ATTRIBUTE VALUE | Interface Stability | Standard | MT-Level | Unsafe |
| ATTRIBUTE TYPE       | ATTRIBUTE VALUE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                |                 |                     |          |          |        |
| Interface Stability  | Standard                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                |                 |                     |          |          |        |
| MT-Level             | Unsafe                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                |                 |                     |          |          |        |
| <b>SEE ALSO</b>      | <code>delscreen(3XCURSES)</code> , <code>doupdate(3XCURSES)</code> , <code>endwin(3XCURSES)</code> , <code>getwin(3XCURSES)</code> , <code>libcurses(3XCURSES)</code> , <code>attributes(5)</code> , <code>standards(5)</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                |                 |                     |          |          |        |

## scr1(3XCURSES)

| <b>NAME</b>          | scr1, scroll, wscr1 – scroll a window                                                                                                                                                                                                                                                                                                                                                                |                |                 |                     |          |          |        |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-----------------|---------------------|----------|----------|--------|
| <b>SYNOPSIS</b>      | <pre>cc [ flag... ] file... -I /usr/xpg4/include -L /usr/xpg4/lib \ -R /usr/xpg4/lib -lcurses [ library... ]  c89 [ flag... ] file... -lcurses [ library... ]  #include &lt;curses.h&gt;  int scr1(int n);  int scroll(WINDOW *win);  int wscr1(WINDOW *win, int n);</pre>                                                                                                                           |                |                 |                     |          |          |        |
| <b>PARAMETERS</b>    | <p><i>n</i> number and direction of lines to scroll</p> <p><i>win</i> pointer to the window in which to scroll</p>                                                                                                                                                                                                                                                                                   |                |                 |                     |          |          |        |
| <b>DESCRIPTION</b>   | <p>The scroll() function scrolls the window <i>win</i> up one line. The current cursor position is not changed.</p> <p>The scr1() and wscr1() functions scroll the window <i>stdscr</i> or <i>win</i> up or down <i>n</i> lines, where <i>n</i> is a positive (scroll up) or negative (scroll down) integer.</p> <p>The scrollok(3XCURSES) function must be enabled for these functions to work.</p> |                |                 |                     |          |          |        |
| <b>RETURN VALUES</b> | On success, these functions return OK. Otherwise, they return ERR.                                                                                                                                                                                                                                                                                                                                   |                |                 |                     |          |          |        |
| <b>ERRORS</b>        | None.                                                                                                                                                                                                                                                                                                                                                                                                |                |                 |                     |          |          |        |
| <b>ATTRIBUTES</b>    | See attributes(5) for descriptions of the following attributes:                                                                                                                                                                                                                                                                                                                                      |                |                 |                     |          |          |        |
|                      | <table border="1"><thead><tr><th>ATTRIBUTE TYPE</th><th>ATTRIBUTE VALUE</th></tr></thead><tbody><tr><td>Interface Stability</td><td>Standard</td></tr><tr><td>MT-Level</td><td>Unsafe</td></tr></tbody></table>                                                                                                                                                                                      | ATTRIBUTE TYPE | ATTRIBUTE VALUE | Interface Stability | Standard | MT-Level | Unsafe |
| ATTRIBUTE TYPE       | ATTRIBUTE VALUE                                                                                                                                                                                                                                                                                                                                                                                      |                |                 |                     |          |          |        |
| Interface Stability  | Standard                                                                                                                                                                                                                                                                                                                                                                                             |                |                 |                     |          |          |        |
| MT-Level             | Unsafe                                                                                                                                                                                                                                                                                                                                                                                               |                |                 |                     |          |          |        |
| <b>SEE ALSO</b>      | clearok(3XCURSES), libcurses(3XCURSES), attributes(5), standards(5)                                                                                                                                                                                                                                                                                                                                  |                |                 |                     |          |          |        |

**NAME** setcchar – set a `cchar_t` type character from a wide character and rendition

**SYNOPSIS**

```
cc [flag...] file... -I /usr/xpg4/include -L /usr/xpg4/lib \
-R /usr/xpg4/lib -lcurses [library...]

c89 [flag...] file... -lcurses [library...]

#include <curses.h>

int setcchar(cchar_t *wcv, const wchar_t *wch, const attr_t attrs,
 short color_pair, const void *opts);
```

**PARAMETERS**

|                   |                                                                                                      |
|-------------------|------------------------------------------------------------------------------------------------------|
| <i>wcv</i>        | Is a pointer to a location where a <code>cchar_t</code> character (and its rendition) can be stored. |
| <i>wch</i>        | Is a pointer to a wide character.                                                                    |
| <i>attrs</i>      | Is the set of attributes to apply to <i>wch</i> in creating <i>wcv</i> .                             |
| <i>color_pair</i> | Is the color pair to apply to <i>wch</i> in creating <i>wcv</i> .                                    |
| <i>opts</i>       | Is reserved for future use. Currently, this must be a null pointer.                                  |

**DESCRIPTION** The `setcchar()` function takes the wide character pointed to by *wch*, combines it with the attributes indicated by *attrs* and the color pair indicated by *color\_pair* and stores the result in the object pointed to by *wcv*.

**RETURN VALUES** On success, the `setcchar()` function returns `OK`. Otherwise, it returns `ERR`.

**ERRORS** None.

**ATTRIBUTES** See `attributes(5)` for descriptions of the following attributes:

| ATTRIBUTE TYPE      | ATTRIBUTE VALUE |
|---------------------|-----------------|
| Interface Stability | Standard        |
| MT-Level            | Unsafe          |

**SEE ALSO** `attroff(3XCURSES)`, `can_change_color(3XCURSES)`, `getcchar(3XCURSES)`, `libcurses(3XCURSES)`, `attributes(5)`, `standards(5)`

## set\_term(3XCURSES)

**NAME** set\_term – switch between terminals

**SYNOPSIS**

```
cc [flag...] file... -I /usr/xpg4/include -L /usr/xpg4/lib \
-R /usr/xpg4/lib -lcurses [library...]

c89 [flag...] file... -lcurses [library...]

#include <curses.h>

SCREEN *set_term(SCREEN *new);
```

**PARAMETERS** *new* Is the new terminal to which the set\_term() function will switch.

**DESCRIPTION** The set\_term() function switches to the terminal specified by *new* and returns a screen reference to the previous terminal. Calls to subsequent X/Open Curses functions affect the new terminal.

**RETURN VALUES** On success, the set\_term() function returns a pointer to the previous screen. Otherwise, it returns a null pointer.

**ERRORS** None.

**ATTRIBUTES** See attributes(5) for descriptions of the following attributes:

| ATTRIBUTE TYPE      | ATTRIBUTE VALUE |
|---------------------|-----------------|
| Interface Stability | Standard        |
| MT-Level            | Unsafe          |

**SEE ALSO** libcurses(3XCURSES), attributes(5), standards(5)

|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |              |                                                   |             |                                                                     |                          |                  |            |                                                             |               |                                  |              |                                          |                |                                                       |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|---------------------------------------------------|-------------|---------------------------------------------------------------------|--------------------------|------------------|------------|-------------------------------------------------------------|---------------|----------------------------------|--------------|------------------------------------------|----------------|-------------------------------------------------------|
| <b>NAME</b>              | slk_attroff, slk_attr_off, slk_attron, slk_attr_on, slk_attrset, slk_attr_set, slk_clear, slk_color, slk_init, slk_label, slk_noutrefresh, slk_refresh, slk_restore, slk_set, slk_touch, slk_wset – soft label functions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |              |                                                   |             |                                                                     |                          |                  |            |                                                             |               |                                  |              |                                          |                |                                                       |
| <b>SYNOPSIS</b>          | <pre>cc [ flag... ] file... -I /usr/xpg4/include -L /usr/xpg4/lib \ -R /usr/xpg4/lib -lcurses [ library... ]  c89 [ flag... ] file... -lcurses [ library... ]  #include &lt;curses.h&gt;  int <b>slk_attroff</b>(const chtype <i>attrs</i>); int <b>slk_attr_off</b>(const attr_t <i>attrs</i>, void *<i>opts</i>); int <b>slk_attron</b>(const chtype <i>attrs</i>); int <b>slk_attr_on</b>(const attr_t <i>attrs</i>, void *<i>opts</i>); int <b>slk_attrset</b>(const chtype <i>attrs</i>); int <b>slk_attr_set</b>(const attr_t <i>attrs</i>, short <i>color_pair_number</i>, void *<i>opts</i>); int <b>slk_clear</b>(void); int <b>slk_color</b>(short <i>color_pair_number</i>); int <b>slk_init</b>(int <i>fmt</i>); char *<b>slk_label</b>(int <i>labnum</i>); int <b>slk_noutrefresh</b>(void); int <b>slk_refresh</b>(void); int <b>slk_restore</b>(void); int <b>slk_set</b>(int <i>labnum</i>, const char *<i>label</i>, int <i>justify</i>); int <b>slk_touch</b>(void); int <b>slk_wset</b>(int <i>labnum</i>, const wchar_t *<i>label</i>, int <i>justify</i>);</pre> |              |                                                   |             |                                                                     |                          |                  |            |                                                             |               |                                  |              |                                          |                |                                                       |
| <b>PARAMETERS</b>        | <table border="0"> <tr> <td style="padding-right: 20px;"><i>attrs</i></td> <td>are the window attributes to be added or removed.</td> </tr> <tr> <td><i>opts</i></td> <td>Is reserved for future use. Currently, this must be a null pointer.</td> </tr> <tr> <td><i>color_pair_number</i></td> <td>Is a color pair.</td> </tr> <tr> <td><i>fmt</i></td> <td>Is the format of how the labels are arranged on the screen.</td> </tr> <tr> <td><i>labnum</i></td> <td>Is the number of the soft label.</td> </tr> <tr> <td><i>label</i></td> <td>Is the name to be given to a soft label.</td> </tr> <tr> <td><i>justify</i></td> <td>Is a number indicating how to justify the label name.</td> </tr> </table>                                                                                                                                                                                                                                                                                                                                                                         | <i>attrs</i> | are the window attributes to be added or removed. | <i>opts</i> | Is reserved for future use. Currently, this must be a null pointer. | <i>color_pair_number</i> | Is a color pair. | <i>fmt</i> | Is the format of how the labels are arranged on the screen. | <i>labnum</i> | Is the number of the soft label. | <i>label</i> | Is the name to be given to a soft label. | <i>justify</i> | Is a number indicating how to justify the label name. |
| <i>attrs</i>             | are the window attributes to be added or removed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |              |                                                   |             |                                                                     |                          |                  |            |                                                             |               |                                  |              |                                          |                |                                                       |
| <i>opts</i>              | Is reserved for future use. Currently, this must be a null pointer.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |              |                                                   |             |                                                                     |                          |                  |            |                                                             |               |                                  |              |                                          |                |                                                       |
| <i>color_pair_number</i> | Is a color pair.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |              |                                                   |             |                                                                     |                          |                  |            |                                                             |               |                                  |              |                                          |                |                                                       |
| <i>fmt</i>               | Is the format of how the labels are arranged on the screen.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |              |                                                   |             |                                                                     |                          |                  |            |                                                             |               |                                  |              |                                          |                |                                                       |
| <i>labnum</i>            | Is the number of the soft label.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |              |                                                   |             |                                                                     |                          |                  |            |                                                             |               |                                  |              |                                          |                |                                                       |
| <i>label</i>             | Is the name to be given to a soft label.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |              |                                                   |             |                                                                     |                          |                  |            |                                                             |               |                                  |              |                                          |                |                                                       |
| <i>justify</i>           | Is a number indicating how to justify the label name.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |              |                                                   |             |                                                                     |                          |                  |            |                                                             |               |                                  |              |                                          |                |                                                       |

slk\_attroff(3XCURSES)

**DESCRIPTION**

The Curses interface manipulates the set of soft function-key labels that exist on many terminals. For those terminals that do not have soft labels, Curses takes over the bottom line of *stdscr*, reducing the size of *stdscr* and the value of the LINES external variable. There can be up to eight labels of up to eight display columns each.

To use soft labels, *slk\_init()* must be called before calling *initscr(3XCURSES)*, *newterm(3XCURSES)*, or *ripoffline(3XCURSES)*. If *initscr()* eventually uses a line from *stdscr* to emulate the soft labels, then *fmt* determines how the labels are arranged on the screen. Setting *fmt* to 0 indicates a 3-2-3 arrangement of the labels; 1 indicates a 4-4 arrangement. Other values for *fmt* are unspecified.

The *slk\_init()* function has the effect of calling *ripoffline()* to reserve one screen line to accommodate the requested format.

The *slk\_set()* and *slk\_wset()* functions specify the text of soft label number *labnum*, within the range from 1 to and including 8. The *label* argument is the string to be put the lable. With *slk\_set()* and *slk\_wset()*, the width of the label is limited to eight columns positions. A null string or a null pointer specifies a blank label. The *justify* argument can have the following values to indicate how to justify *label* within the space reserved for it:

- 0           Align the start of *label* with the start of the space
- 1           Center *label* within the space
- 2           Align the end of *label* with the end of the space

The *slk\_refresh()* and *slk\_noutrefresh()* functions correspond to the *wrefresh(3XCURSES)* and *wnoutrefresh(3XCURSES)* functions.

The *slk\_label()* function obtains soft label number *labnum*.

The *slk\_clear()* function immediately clears the soft labels from the screen.

The *slk\_restore()* function immediately restores the soft labels to the screen after a call to *slk\_clear()*.

The *slk\_touch()* function forces all the soft labels to be output the next time *slk\_refresh()* or *slk\_noutrefresh()* is called.

The *slk\_attron()*, *slk\_attrset()*, and *slk\_attroff()* functions correspond to the *attron(3XCURSES)*, *attrset(3XCURSES)*, and *attroff(3XCURSES)* functions. They have an effect only if soft labels are stimulated on the bottom line of the screen.

The *slk\_attr\_on()*, *slk\_attr\_off()*, *slk\_attr\_set()* and *slk\_color()* functions correspond to the *attr\_on(3XCURSES)*, *attr\_off(3XCURSES)*, *attr\_set(3XCURSES)*, and *color\_set(3XCURSES)* functions. As a result, they support color and the attribute constants with the WA\_ prefix.

slk\_attroff(3XCURSES)

The *opts* argument is reserved for definition in a future release. Currently, the *opts* argument is a null pointer.

**RETURN VALUES** Upon successful completion, the `slk_label()` function returns the requested label with leading and trailing blanks stripped. Otherwise, it returns a null pointer.

Upon successful completion, the other functions return OK. Otherwise, they return ERR.

**ERRORS** No errors are defined.

**USAGE** When using multi-byte character sets, applications should check the width of the string by calling `mbstowcs(3C)` and then `wcswidth(3C)` before calling `slk_set()`. When using wide characters, applications should check the width of the string by calling `wcswidth()` before calling `slk_set()`.

Since the number of columns that a wide string will occupy is codeset-specific, call `wcwidth(3C)` and `wcswidth(3C)` to check the number of column positions in the string before calling `slk_wset()`.

Most applications would use `slk_noutrefresh()` because a `wrefresh()` is likely to follow soon.

**ATTRIBUTES** See `attributes(5)` for descriptions of the following attributes:

| ATTRIBUTE TYPE      | ATTRIBUTE VALUE |
|---------------------|-----------------|
| Interface Stability | Standard        |
| MT-Level            | Unsafe          |

**SEE ALSO** `attr_get(3XCURSES)`, `attroff(3XCURSES)`, `delscreen(3XCURSES)`, `libcurses(3XCURSES)`, `mbstowcs(3C)`, `ripoffline(3XCURSES)`, `wcswidth(3C)`, `wcwidth(3C)`, `attributes(5)`, `standards(5)`

## standend(3XCURSES)

| <b>NAME</b>          | standend, standout, wstandend, wstandout – set/clear window attributes                                                                                                                                                                                                                             |                |                 |                     |          |          |        |
|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-----------------|---------------------|----------|----------|--------|
| <b>SYNOPSIS</b>      | <pre>cc [ flag... ] file... -I /usr/xpg4/include -L /usr/xpg4/lib \ -R /usr/xpg4/lib -lcurses [ library... ]  c89 [ flag... ] file... -lcurses [ library... ]  #include &lt;curses.h&gt;  int standend(void);  int standout(void);  int wstandend(WINDOW *win);  int wstandout(WINDOW *win);</pre> |                |                 |                     |          |          |        |
| <b>PARAMETERS</b>    | <i>win</i> Is a pointer to the window in which attribute changes are to be made.                                                                                                                                                                                                                   |                |                 |                     |          |          |        |
| <b>DESCRIPTION</b>   | <p>The standend() and wstandend() functions turn off all attributes associated with stdscr and <i>win</i> respectively.</p> <p>The standout() and wstandout() functions turn on the A_STANDOUT attribute of stdscr and <i>win</i> respectively.</p>                                                |                |                 |                     |          |          |        |
| <b>RETURN VALUES</b> | These functions always return 1.                                                                                                                                                                                                                                                                   |                |                 |                     |          |          |        |
| <b>ERRORS</b>        | None.                                                                                                                                                                                                                                                                                              |                |                 |                     |          |          |        |
| <b>ATTRIBUTES</b>    | See attributes(5) for descriptions of the following attributes:                                                                                                                                                                                                                                    |                |                 |                     |          |          |        |
|                      | <table border="1"><thead><tr><th>ATTRIBUTE TYPE</th><th>ATTRIBUTE VALUE</th></tr></thead><tbody><tr><td>Interface Stability</td><td>Standard</td></tr><tr><td>MT-Level</td><td>Unsafe</td></tr></tbody></table>                                                                                    | ATTRIBUTE TYPE | ATTRIBUTE VALUE | Interface Stability | Standard | MT-Level | Unsafe |
| ATTRIBUTE TYPE       | ATTRIBUTE VALUE                                                                                                                                                                                                                                                                                    |                |                 |                     |          |          |        |
| Interface Stability  | Standard                                                                                                                                                                                                                                                                                           |                |                 |                     |          |          |        |
| MT-Level             | Unsafe                                                                                                                                                                                                                                                                                             |                |                 |                     |          |          |        |
| <b>SEE ALSO</b>      | attr_get(3XCURSES), attroff(3XCURSES), libcurses(3XCURSES), attributes(5), standards(5)                                                                                                                                                                                                            |                |                 |                     |          |          |        |

- NAME** | stdscr – default window
- SYNOPSIS** | 

```
cc [flag...] file... -I /usr/xpg4/include -L /usr/xpg4/lib \
-R /usr/xpg4/lib -lcurses [library...]
```
- | 

```
c89 [flag...] file... -lcurses [library...]
```
- | 

```
#include <curses.h>
```
- | 

```
extern WINDOW *stdscr;
```
- DESCRIPTION** | The external variable `stdscr` specifies the default window used by functions that to not specify a window using an argument of type `WINDOW *`. Other windows may be created using `newwin()`.
- ATTRIBUTES** | See `attributes(5)` for descriptions of the following attributes:

| ATTRIBUTE TYPE      | ATTRIBUTE VALUE |
|---------------------|-----------------|
| Interface Stability | Standard        |
| MT-Level            | Unsafe          |

- SEE ALSO** | `derwin(3XCURSES)`, `libcurses(3XCURSES)`, `attributes(5)`, `standards(5)`

syncok(3XCURSES)

**NAME** syncok, wcursyncup, wsyncdown, wsyncup – synchronize window with its parents or children

**SYNOPSIS**

```
cc [flag...] file... -I /usr/xpg4/include -L /usr/xpg4/lib \
-R /usr/xpg4/lib -lcurses [library...]

c89 [flag...] file... -lcurses [library...]

#include <curses.h>

int syncok(WINDOW *win, bool bf);

void wcursyncup(WINDOW *win);

void wsyncdown(WINDOW *win);

void wsyncup(WINDOW *win);
```

**PARAMETERS**

*win* Is a pointer to a window.

*bf* Is a Boolean expression.

**DESCRIPTION**

The syncok() function uses the value of *bf* to determine whether or not the window *win*'s ancestors are implicitly touched whenever there is a change to *win*. If *bf* is TRUE, this touching occurs. If *bf* is FALSE, it does not occur. The initial value for *bf* is FALSE.

The wcursyncup() function moves the cursor in *win*'s ancestors to match its position in *win*.

The wsyncdown() function touches *win* if any of its ancestors have been touched.

The wsyncup() function touches all ancestors of *win*.

**RETURN VALUES**

On success, the syncok() function returns OK. Otherwise, it returns ERR.

The other functions do not return a value.

**ERRORS**

None.

**ATTRIBUTES**

See attributes(5) for descriptions of the following attributes:

| ATTRIBUTE TYPE      | ATTRIBUTE VALUE |
|---------------------|-----------------|
| Interface Stability | Standard        |
| MT-Level            | Unsafe          |

**SEE ALSO**

derwin(3XCURSES), doupdate(3XCURSES), is\_linetouched(3XCURSES), libcurses(3XCURSES), attributes(5), standards(5)

| <b>NAME</b>          | termattrs, term_attrs – get supported terminal video attributes                                                                                                                                                                                                                                                                |                |                 |                     |          |          |        |
|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-----------------|---------------------|----------|----------|--------|
| <b>SYNOPSIS</b>      | <pre>cc [ flag... ] file... -I /usr/xpg4/include -L /usr/xpg4/lib \ -R /usr/xpg4/lib -lcurses [ library... ]  c89 [ flag... ] file... -lcurses [ library... ]  #include &lt;curses.h&gt;  chtype termattrs(void);  attr_t term_attrs(void);</pre>                                                                              |                |                 |                     |          |          |        |
| <b>DESCRIPTION</b>   | <p>The <code>termattrs()</code> function extracts the video attributes of the current terminal which is supported by the <code>chtype</code> data type.</p> <p>The <code>term_attrs()</code> function extracts information for the video attributes of the current terminal which is supported for a <code>cchar_t</code>.</p> |                |                 |                     |          |          |        |
| <b>RETURN VALUES</b> | <p>The <code>termattrs()</code> function returns a logical OR of <code>A_</code> values of all video attributes supported by the terminal.</p> <p>The <code>term_attrs()</code> function returns a logical OR of <code>WA_</code> values of all video attributes supported by the terminal.</p>                                |                |                 |                     |          |          |        |
| <b>ERRORS</b>        | No errors are defined.                                                                                                                                                                                                                                                                                                         |                |                 |                     |          |          |        |
| <b>ATTRIBUTES</b>    | See <code>attributes(5)</code> for descriptions of the following attributes:                                                                                                                                                                                                                                                   |                |                 |                     |          |          |        |
|                      | <table border="1"> <thead> <tr> <th>ATTRIBUTE TYPE</th> <th>ATTRIBUTE VALUE</th> </tr> </thead> <tbody> <tr> <td>Interface Stability</td> <td>Standard</td> </tr> <tr> <td>MT-Level</td> <td>Unsafe</td> </tr> </tbody> </table>                                                                                               | ATTRIBUTE TYPE | ATTRIBUTE VALUE | Interface Stability | Standard | MT-Level | Unsafe |
| ATTRIBUTE TYPE       | ATTRIBUTE VALUE                                                                                                                                                                                                                                                                                                                |                |                 |                     |          |          |        |
| Interface Stability  | Standard                                                                                                                                                                                                                                                                                                                       |                |                 |                     |          |          |        |
| MT-Level             | Unsafe                                                                                                                                                                                                                                                                                                                         |                |                 |                     |          |          |        |
| <b>SEE ALSO</b>      | <code>attr_get(3XCURSES)</code> , <code>attroff(3XCURSES)</code> , <code>libcurses(3XCURSES)</code> , <code>attributes(5)</code> , <code>standards(5)</code>                                                                                                                                                                   |                |                 |                     |          |          |        |

## termname(3XCURSES)

**NAME** | termname – return the value of the environmental variable TERM

**SYNOPSIS** | `cc [ flag... ] file... -I /usr/xpg4/include -L /usr/xpg4/lib \`  
| `-R /usr/xpg4/lib -lcurses [ library... ]`

| `c89 [ flag... ] file... -lcurses [ library... ]`

| `#include <curses.h>`

| `char *termname(void);`

**DESCRIPTION** | The `termname()` function returns a pointer to the value of the environmental variable TERM (truncated to 14 characters).

**RETURN VALUES** | The `termname()` returns a pointer to the terminal's name.

**ERRORS** | None.

**ATTRIBUTES** | See `attributes(5)` for descriptions of the following attributes:

| ATTRIBUTE TYPE      | ATTRIBUTE VALUE |
|---------------------|-----------------|
| Interface Stability | Standard        |
| MT-Level            | Unsafe          |

**SEE ALSO** | `del_curterm(3XCURSES)`, `libcurses(3XCURSES)`, `attributes(5)`, `standards(5)`

|                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>NAME</b>          | tgetent, tgetflag, tgetnum, tgetstr, tgoto – emulate the termcap database                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>SYNOPSIS</b>      | <pre>cc [ flag... ] file... -I /usr/xpg4/include -L /usr/xpg4/lib \ -R /usr/xpg4/lib -lcurses [ library... ]  c89 [ flag... ] file... -lcurses [ library... ]  #include &lt;term.h&gt;  int tgetent(char *bp, const char *name); int tgetflag(char id[2]); int tgetnum(char id[2]); char *tgetstr(char id[2], char **area); char *tgoto(char *cap, int col, int row);</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>PARAMETERS</b>    | <p><i>bp</i>                    Is a pointer to a buffer. This parameter is ignored.</p> <p><i>name</i>                   Is the termcap entry to look up.</p> <p><i>cap</i>                    Is the pointer to a termcap capability.</p> <p><i>area</i>                   Is a pointer to the area where tgetstr() stores the decoded string.</p> <p><i>col</i>                    Is the column placement of the new cursor.</p> <p><i>row</i>                    Is the row placement of the new cursor.</p>                                                                                                                                                                                                                                                                                                                                                                           |
| <b>DESCRIPTION</b>   | <p>The tgetent() function looks up the termcap entry for <i>name</i>. The emulation ignores the buffer pointer <i>bp</i>.</p> <p>The tgetflag() function gets the Boolean entry for <i>id</i>.</p> <p>The tgetnum() function gets the numeric entry for <i>id</i>.</p> <p>The tgetstr() function gets the string entry for <i>id</i>. If <i>area</i> is not a null pointer and does not point to a null pointer, tgetstr() copies the string entry into the buffer pointed to by <i>*area</i> and advances the variable pointed to by <i>area</i> to the first byte after the copy of the string entry.</p> <p>The tgoto() function instantiates the parameters <i>col</i> and <i>row</i> into the capability <i>cap</i> and returns a pointer to the resulting string.</p> <p>All of the information available in the terminfo database need not be available through these functions.</p> |
| <b>RETURN VALUES</b> | <p>Upon successful completion, those functions that return integers return OK. Otherwise, they return ERR.</p> <p>Those functions that return pointers return a null pointer when an error occurs.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>ERRORS</b>        | No errors are defined.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

tgetent(3XCURSES)

**USAGE** | These functions are included as a conversion aid for programs that use the `termcap` library. Their arguments are the same and the functions are emulated using the `terminfo` database.

These functions are only guaranteed to operate reliably on character sets in which each character fits into a single byte, whose attributes can be expressed using only constants with the `A_` prefix.

Any terminal capabilities from the `terminfo` database that cannot be retrieved using these functions can be retrieved using the functions described on the `tigetflag(3XCURSES)` manual page.

Portable applications must use `tputs(3XCURSES)` to output the strings returned by `tgetstr()` and `tgoto()`.

**ATTRIBUTES** | See `attributes(5)` for descriptions of the following attributes:

| ATTRIBUTE TYPE      | ATTRIBUTE VALUE |
|---------------------|-----------------|
| Interface Stability | Standard        |
| MT-Level            | Unsafe          |

**SEE ALSO** | `libcurses(3XCURSES)`, `putp(3XCURSES)`, `setupterm(3XCURSES)`, `tigetflag(3XCURSES)`, `attributes(5)`, `standards(5)`

|                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>NAME</b>          | tigetflag, tigetnum, tigetstr, tparm – return the value of a terminfo capability                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>SYNOPSIS</b>      | <pre>cc [ flag... ] file... -I /usr/xpg4/include -L /usr/xpg4/lib \ -R /usr/xpg4/lib -lcurses [ library... ]  c89 [ flag... ] file... -lcurses [ library... ]  #include &lt;term.h&gt;  int <b>tigetflag</b>(char *capname);  int <b>tigetnum</b>(char *capname);  char *<b>tigetstr</b>(char *capname);  char *<b>tparm</b>(char *cap, long p1, long p2, long p3, long p4, long p5,             long p6, long p7, long p8, long p9);</pre>                                                                                                                                                                                                             |
| <b>PARAMETERS</b>    | <p><i>capname</i>                    Is the name of the terminfo capability for which the value is required.</p> <p><i>cap</i>                         Is a pointer to a string capability.</p> <p><i>p1...p9</i>                    Are the parameters to be instantiated.</p>                                                                                                                                                                                                                                                                                                                                                                         |
| <b>DESCRIPTION</b>   | <p>The <code>tigetflag()</code>, <code>tigetnum()</code>, and <code>tigetstr()</code> functions return values for terminfo capabilities passed to them.</p> <p>The following null-terminated arrays contain the <i>capnames</i>, the termcap codes and full C names for each of the terminfo variables.</p> <pre>char *boolnames, *boolcodes, *boolfnames char *numnames, *numcodes, *numfnames char *strnames, *strcodes, *strfnames</pre> <p>The <code>tparm()</code> function instantiates a parameterized string using nine arguments. The string is suitable for output processing by <code>tputs()</code>.</p>                                    |
| <b>RETURN VALUES</b> | <p>On success, the <code>tigetflg()</code>, <code>tigetnum()</code>, and <code>tigetstr()</code> functions return the specified terminfo capability.</p> <p><code>tigetflag()</code> returns <code>-1</code> if <i>capname</i> is not a Boolean capability.</p> <p><code>tigetnum()</code> returns <code>-2</code> if <i>capname</i> is not a numeric capability.</p> <p><code>tigetstr()</code> returns <code>(char *)-1</code> if <i>capname</i> is not a string capability.</p> <p>On success, the <code>tparm()</code> function returns <i>cap</i> in a static buffer with the parameterization resolved. Otherwise, it returns a null pointer.</p> |
| <b>ERRORS</b>        | None.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

tigetflag(3XCURSES)

**ATTRIBUTES** See `attributes(5)` for descriptions of the following attributes:

| ATTRIBUTE TYPE      | ATTRIBUTE VALUE |
|---------------------|-----------------|
| Interface Stability | Standard        |
| MT-Level            | Unsafe          |

**SEE ALSO** `libcurses(3XCURSES)`, `tgetent(3XCURSES)`, `terminfo(4)`, `attributes(5)`, `standards(5)`

| <b>NAME</b>          | typeahead – check for type-ahead characters                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                |                 |                     |          |          |        |
|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-----------------|---------------------|----------|----------|--------|
| <b>SYNOPSIS</b>      | <pre>cc [ flag... ] file... -I /usr/xpg4/include -L /usr/xpg4/lib \ -R /usr/xpg4/lib -lcurses [ library... ]  c89 [ flag... ] file... -lcurses [ library... ]  #include &lt;curses.h&gt;  int typeahead(int fd);</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |                 |                     |          |          |        |
| <b>PARAMETERS</b>    | <p><i>fd</i> Is the file descriptor that is used to check for type-ahead characters.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                |                 |                     |          |          |        |
| <b>DESCRIPTION</b>   | <p>The <code>typeahead()</code> function specifies the file descriptor (<i>fd</i>) to use to check for type-ahead characters (characters typed by the user but not yet processed by X/Open Curses).</p> <p>X/Open Curses checks for type-ahead characters periodically while updating the screen. If characters are found, the current update is postponed until the next <code>refresh(3XCURSES)</code> or <code>doupdate(3XCURSES)</code>. This speeds up response to commands that have been typed ahead. Normally, the input file pointer passed to <code>newterm(3XCURSES)</code>, or <code>stdin</code> in the case of <code>initscr(3XCURSES)</code>, is used for type-ahead checking.</p> <p>If <i>fd</i> is -1, no type-ahead checking is done.</p> |                |                 |                     |          |          |        |
| <b>RETURN VALUES</b> | On success, the <code>typeahead()</code> function returns OK. Otherwise, it returns ERR.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                |                 |                     |          |          |        |
| <b>ERRORS</b>        | None.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                |                 |                     |          |          |        |
| <b>ATTRIBUTES</b>    | See <code>attributes(5)</code> for descriptions of the following attributes:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                |                 |                     |          |          |        |
|                      | <table border="1"> <thead> <tr> <th>ATTRIBUTE TYPE</th> <th>ATTRIBUTE VALUE</th> </tr> </thead> <tbody> <tr> <td>Interface Stability</td> <td>Standard</td> </tr> <tr> <td>MT-Level</td> <td>Unsafe</td> </tr> </tbody> </table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | ATTRIBUTE TYPE | ATTRIBUTE VALUE | Interface Stability | Standard | MT-Level | Unsafe |
| ATTRIBUTE TYPE       | ATTRIBUTE VALUE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                |                 |                     |          |          |        |
| Interface Stability  | Standard                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                |                 |                     |          |          |        |
| MT-Level             | Unsafe                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |                 |                     |          |          |        |
| <b>SEE ALSO</b>      | <code>doupdate(3XCURSES)</code> , <code>getch(3XCURSES)</code> , <code>initscr(3XCURSES)</code> , <code>libcurses(3XCURSES)</code> , <code>attributes(5)</code> , <code>standards(5)</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                |                 |                     |          |          |        |

unctrl(3XCURSES)

**NAME** unctrl – generate printable representation of a character

**SYNOPSIS** `cc [ flag... ] file... -I /usr/xpg4/include -L /usr/xpg4/lib \`  
`-R /usr/xpg4/lib -lcurses [ library... ]`

**c89** `[ flag... ] file... -lcurses [ library... ]`

```
#include <unctrl.h>
char *unctrl (chtype c);
```

**PARAMETERS** *c* Is a character.

**DESCRIPTION** The unctrl () function generates a character string that is a printable representation of *c*. If *c* is a control character, it is converted to the ^X notation. If *c* contains rendition information, the effect is undefined.

**RETURN VALUES** Upon successful completion, the unctrl () function returns the generated string. Otherwise, it returns a null pointer.

**ERRORS** No errors are defined.

**ATTRIBUTES** See attributes(5) for descriptions of the following attributes:

| ATTRIBUTE TYPE      | ATTRIBUTE VALUE |
|---------------------|-----------------|
| Interface Stability | Standard        |
| MT-Level            | Unsafe          |

**SEE ALSO** addch(3XCURSES), addstr(3XCURSES), libcurses(3XCURSES),  
wunctrl(3XCURSES), attributes(5), standards(5)

**NAME** ungetch, unget\_wch – push character back onto the input queue

**SYNOPSIS** `cc [ flag... ] file... -I /usr/xpg4/include -L /usr/xpg4/lib \
-R /usr/xpg4/lib -lcurses [ library... ]`

`c89 [ flag... ] file... -lcurses [ library... ]`

```
#include <curses.h>
int ungetch(int ch);
int unget_wch(const wchar_t wch);
```

**PARAMETERS** *ch* Is the single byte character to be put back in the input queue for the next call to `getch(3XCURSES)`.

*wch* Is the wide character to be put back in the input queue for the next call to `get_wch(3XCURSES)`.

**DESCRIPTION** The `ungetch()` function pushes *ch* back onto the input queue until the next call to `getch()`.

The `unget_wch()` function is similar to `ungetch()` except that *ch* can be of type `wchar_t`.

**RETURN VALUES** On success, these functions return OK. Otherwise, they return ERR.

**ERRORS** None.

**ATTRIBUTES** See `attributes(5)` for descriptions of the following attributes:

| ATTRIBUTE TYPE      | ATTRIBUTE VALUE |
|---------------------|-----------------|
| Interface Stability | Standard        |
| MT-Level            | Unsafe          |

**SEE ALSO** `get_wch(3XCURSES)`, `getch(3XCURSES)`, `libcurses(3XCURSES)`, `attributes(5)`, `standards(5)`

## use\_env(3XCURSES)

**NAME** use\_env – specify source of screen size information

**SYNOPSIS**

```
cc [flag...] file... -I /usr/xpg4/include -L /usr/xpg4/lib \
-R /usr/xpg4/lib -lcurses [library...]

c89 [flag...] file... -lcurses [library...]

#include <curses.h>

void use_env (bool boolval);
```

**PARAMETERS** *boolval* Is a Boolean expression.

**DESCRIPTION** The use\_env() function specifies the technique by which the implementation determines the size of the screen. If *boolval* is FALSE, the implementation uses the values of *lines* and *columns* specified in the terminfo database. If *boolval* is TRUE, the implementation uses the LINES and COLUMNS environmental variables. The initial value is TRUE.

Any call to use\_env() must precede calls to initscr(3XCURSES), newterm(3XCURSES), or setupterm(3XCURSES).

**RETURN VALUES** The use\_env() function does not return a value.

**ERRORS** No errors are defined.

**ATTRIBUTES** See attributes(5) for descriptions of the following attributes:

| ATTRIBUTE TYPE      | ATTRIBUTE VALUE |
|---------------------|-----------------|
| Interface Stability | Standard        |
| MT-Level            | Unsafe          |

**SEE ALSO** del\_curterm(3XCURSES), initscr(3XCURSES), libcurses(3XCURSES), attributes(5), standards(5)

|                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>NAME</b>          | vidattr, vid_attr, vidputs, vid_puts – output attributes to the terminal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>SYNOPSIS</b>      | <pre>cc [ flag... ] file... -I /usr/xpg4/include -L /usr/xpg4/lib \ -R /usr/xpg4/lib -lcurses [ library... ]  c89 [ flag... ] file... -lcurses [ library... ]  #include &lt;curses.h&gt;  int vidattr(chtype attr);  int vid_attr(attr_t attr, short color_pair_number, void *opt);  int vidputs(chtype attr, int (*putfunc) (int));  int vid_puts(attr_t attr, short color_pair_number, void *opt, int (*putfunc) (int));</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>PARAMETERS</b>    | <p><i>attr</i> Is the rendition of the foreground window.</p> <p><i>color_pair_number</i> Is a color pair.</p> <p><i>opt</i> Is reserved for future use. Currently, this must be a null pointer.</p> <p><i>putfunc</i> Is a user-supplied output function.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>DESCRIPTION</b>   | <p>These functions output commands to the terminal that change the terminal's attributes.</p> <p>If the terminfo database indicates that the terminal in use can display characters in the rendition specified by <i>attr</i>, then <code>vidattr()</code> outputs one or more commands to request that the terminal display subsequent characters in that rendition. The function outputs by calling <code>putchar(3C)</code>. The <code>vidattr()</code> function neither relies on your updates the model which Curses maintains of the prior rendition mode.</p> <p>The <code>vidputs()</code> function computes the terminal output string that <code>vidattr()</code> does, based on <i>attr</i>, but <code>vidputs()</code> outputs by calling the user-supplied function <i>putfunc</i>. The <code>vid_attr()</code> and <code>vid_puts()</code> functions correspond to <code>vidattr()</code> and <code>vidputs()</code> respectively, but take a set of arguments, one of type <code>attr_t</code> for the attributes, one of type <code>short</code> for the color pair number, and a <code>void *</code>, and thus support the attribute constants with the <code>WA_</code> prefix.</p> <p>The <i>opts</i> argument is reserved for definition in a future release. Currently, it is implemented as a null pointer.</p> <p>The user-supplied function <i>putfunc</i> (which can be specified as an argument to either <code>vidputs()</code> or <code>vid_puts()</code>) is either <code>putchar()</code> or some other function with the same prototype. Both the <code>vidputs()</code> and <code>vid_puts()</code> functions ignore the return value of <i>putfunc</i>.</p> |
| <b>RETURN VALUES</b> | Upon successful completion, these functions return OK. Otherwise, they return ERR.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>ERRORS</b>        | No errors are defined.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

vidattr(3XCURSES)

**USAGE** After use of any of these functions, the model Curses maintains of the state of the terminal might not match the actual state of the terminal. The application should touch and refresh the window before resuming conventional use of Curses.

Of these functions requires that the application contain so much information about a particular class of terminal that it defeats the purpose of using Curses.

On some terminals, a command to change rendition conceptually occupies space in the screen buffer (with or without width). Thus, a command to set the terminal to a new rendition would change the rendition of some characters already displayed.

**ATTRIBUTES** See `attributes(5)` for descriptions of the following attributes:

| ATTRIBUTE TYPE      | ATTRIBUTE VALUE |
|---------------------|-----------------|
| Interface Stability | Standard        |
| MT-Level            | Unsafe          |

**SEE ALSO** `douupdate(3XCURSES)`, `is_linetouched(3XCURSES)`, `libcurses(3XCURSES)`, `putchar(3C)`, `tigetflag(3XCURSES)`, `attributes(5)`, `standards(5)`

| <b>NAME</b>          | vw_printw – print formatted output in window                                                                                                                                                                                                                                      |                |                              |                     |                                       |            |                                                                  |
|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|------------------------------|---------------------|---------------------------------------|------------|------------------------------------------------------------------|
| <b>SYNOPSIS</b>      | <pre>cc [ flag... ] file... -I /usr/xpg4/include -L /usr/xpg4/lib \ -R /usr/xpg4/lib -lcurses [ library... ]  c89 [ flag... ] file... -lcurses [ library... ]  #include &lt;stdarg.h&gt; #include &lt;curses.h&gt;  int vw_printw(WINDOW *win, char *fmt, va_list varlist);</pre> |                |                              |                     |                                       |            |                                                                  |
| <b>PARAMETERS</b>    | <table> <tr> <td><i>fmt</i></td> <td>Is a printf() format string.</td> </tr> <tr> <td><i>varlist</i></td> <td>Is a pointer to a list of parameters.</td> </tr> <tr> <td><i>win</i></td> <td>Is a pointer to the window in which the string is to be written.</td> </tr> </table>  | <i>fmt</i>     | Is a printf() format string. | <i>varlist</i>      | Is a pointer to a list of parameters. | <i>win</i> | Is a pointer to the window in which the string is to be written. |
| <i>fmt</i>           | Is a printf() format string.                                                                                                                                                                                                                                                      |                |                              |                     |                                       |            |                                                                  |
| <i>varlist</i>       | Is a pointer to a list of parameters.                                                                                                                                                                                                                                             |                |                              |                     |                                       |            |                                                                  |
| <i>win</i>           | Is a pointer to the window in which the string is to be written.                                                                                                                                                                                                                  |                |                              |                     |                                       |            |                                                                  |
| <b>DESCRIPTION</b>   | The vw_printw() function achieves the same effect as wprintw(3XCURSES) using a variable argument list. The third argument is a va_list, as defined in <stdarg.h>.                                                                                                                 |                |                              |                     |                                       |            |                                                                  |
| <b>RETURN VALUES</b> | Upon successful completion, vw_printw() returns OK. Otherwise, it returns ERR.                                                                                                                                                                                                    |                |                              |                     |                                       |            |                                                                  |
| <b>ERRORS</b>        | No errors are defined.                                                                                                                                                                                                                                                            |                |                              |                     |                                       |            |                                                                  |
| <b>USAGE</b>         | The vw_printw() function is preferred over wprintw(3XCURSES). The use of the wprintw() and vw_printw() in the same file will not work, due to the requirements to include <varargs.h> and <stdarg.h>, which both contain definitions of va_list.                                  |                |                              |                     |                                       |            |                                                                  |
| <b>ATTRIBUTES</b>    | See attributes(5) for descriptions of the following attributes:                                                                                                                                                                                                                   |                |                              |                     |                                       |            |                                                                  |
|                      | <table border="1"> <thead> <tr> <th>ATTRIBUTE TYPE</th> <th>ATTRIBUTE VALUE</th> </tr> </thead> <tbody> <tr> <td>Interface Stability</td> <td>Standard</td> </tr> <tr> <td>MT-Level</td> <td>Unsafe</td> </tr> </tbody> </table>                                                  | ATTRIBUTE TYPE | ATTRIBUTE VALUE              | Interface Stability | Standard                              | MT-Level   | Unsafe                                                           |
| ATTRIBUTE TYPE       | ATTRIBUTE VALUE                                                                                                                                                                                                                                                                   |                |                              |                     |                                       |            |                                                                  |
| Interface Stability  | Standard                                                                                                                                                                                                                                                                          |                |                              |                     |                                       |            |                                                                  |
| MT-Level             | Unsafe                                                                                                                                                                                                                                                                            |                |                              |                     |                                       |            |                                                                  |
| <b>SEE ALSO</b>      | libcurses(3XCURSES), mvprintw(3XCURSES), printf(3C), attributes(5), standards(5)                                                                                                                                                                                                  |                |                              |                     |                                       |            |                                                                  |

## vwprintw(3XCURSES)

**NAME** | vwprintw – print formatted output in window

**SYNOPSIS** | 

```
cc [flag...] file... -I /usr/xpg4/include -L /usr/xpg4/lib \
-R /usr/xpg4/lib -lcurses [library...]

c89 [flag...] file... -lcurses [library...]

#include <varargs.h>
#include <curses.h>

int vwprintw(WINDOW *win, char *fmt, va_list varlist);
```

**PARAMETERS** | *fmt* | Is a printf() format string.  
*varlist* | Is a pointer to a list of parameters.  
*win* | Is a pointer to the window in which the string is to be written.

**DESCRIPTION** | The vwprintw() function achieves the same effect as wprintw(3XCURSES) using a variable argument list. The third argument is a va\_list, as defined in <varargs.h>.

**RETURN VALUES** | Upon successful completion, vwprintw() returns OK. Otherwise, it returns ERR.

**ERRORS** | No errors are defined.

**USAGE** | The vwprintw() function is deprecated; the vw\_printw(3XCURSES) function is preferred. The use of the vwprintw() and vw\_printw() in the same file will not work, due to the requirements to include <varargs.h> and <stdarg.h>, which both contain definitions of va\_list.

**ATTRIBUTES** | See attributes(5) for descriptions of the following attributes:

| ATTRIBUTE TYPE      | ATTRIBUTE VALUE |
|---------------------|-----------------|
| Interface Stability | Standard        |
| MT-Level            | Unsafe          |

**SEE ALSO** | libcurses(3XCURSES), mvprintw(3XCURSES), printf(3C), vw\_printw(3XCURSES), attributes(5), standards(5)

| <b>NAME</b>          | vw_scanw – convert formatted input from a window                                                                                                                                                                                                                                 |                |                              |                     |                                       |            |                                                                  |
|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|------------------------------|---------------------|---------------------------------------|------------|------------------------------------------------------------------|
| <b>SYNOPSIS</b>      | <pre>cc [ flag... ] file... -I /usr/xpg4/include -L /usr/xpg4/lib \ -R /usr/xpg4/lib -lcurses [ library... ]  c89 [ flag... ] file... -lcurses [ library... ]  #include &lt;stdarg.h&gt; #include &lt;curses.h&gt;  int vw_scanw(WINDOW *win, char *fmt, va_list varlist);</pre> |                |                              |                     |                                       |            |                                                                  |
| <b>PARAMETERS</b>    | <table> <tr> <td><i>fmt</i></td> <td>Is a scanf () format string.</td> </tr> <tr> <td><i>varlist</i></td> <td>Is a pointer to a list of parameters.</td> </tr> <tr> <td><i>win</i></td> <td>Is a pointer to the window in which the character is to be read.</td> </tr> </table> | <i>fmt</i>     | Is a scanf () format string. | <i>varlist</i>      | Is a pointer to a list of parameters. | <i>win</i> | Is a pointer to the window in which the character is to be read. |
| <i>fmt</i>           | Is a scanf () format string.                                                                                                                                                                                                                                                     |                |                              |                     |                                       |            |                                                                  |
| <i>varlist</i>       | Is a pointer to a list of parameters.                                                                                                                                                                                                                                            |                |                              |                     |                                       |            |                                                                  |
| <i>win</i>           | Is a pointer to the window in which the character is to be read.                                                                                                                                                                                                                 |                |                              |                     |                                       |            |                                                                  |
| <b>DESCRIPTION</b>   | The vw_scanw () function achieves the same effect as wscanw(3XCURSES) using a variable argument list. The third argument is a va_list, as defined in <stdarg.h>.                                                                                                                 |                |                              |                     |                                       |            |                                                                  |
| <b>RETURN VALUES</b> | Upon successful completion, vw_scanw () returns OK. Otherwise, it returns ERR.                                                                                                                                                                                                   |                |                              |                     |                                       |            |                                                                  |
| <b>ERRORS</b>        | No errors are defined.                                                                                                                                                                                                                                                           |                |                              |                     |                                       |            |                                                                  |
| <b>USAGE</b>         | The vw_scanw () function is preferred over vwscanw(3XCURSES). The use of the vwscanw () and vw_scanw () in the same file will not work, due to the requirements to include <varargs.h> and <stdarg.h>, which both contain definitions of va_list.                                |                |                              |                     |                                       |            |                                                                  |
| <b>ATTRIBUTES</b>    | See attributes(5) for descriptions of the following attributes:                                                                                                                                                                                                                  |                |                              |                     |                                       |            |                                                                  |
|                      | <table border="1"> <thead> <tr> <th>ATTRIBUTE TYPE</th> <th>ATTRIBUTE VALUE</th> </tr> </thead> <tbody> <tr> <td>Interface Stability</td> <td>Standard</td> </tr> <tr> <td>MT-Level</td> <td>Unsafe</td> </tr> </tbody> </table>                                                 | ATTRIBUTE TYPE | ATTRIBUTE VALUE              | Interface Stability | Standard                              | MT-Level   | Unsafe                                                           |
| ATTRIBUTE TYPE       | ATTRIBUTE VALUE                                                                                                                                                                                                                                                                  |                |                              |                     |                                       |            |                                                                  |
| Interface Stability  | Standard                                                                                                                                                                                                                                                                         |                |                              |                     |                                       |            |                                                                  |
| MT-Level             | Unsafe                                                                                                                                                                                                                                                                           |                |                              |                     |                                       |            |                                                                  |
| <b>SEE ALSO</b>      | libcurses(3XCURSES), mvscanw(3XCURSES), scanf(3C), attributes(5), standards(5)                                                                                                                                                                                                   |                |                              |                     |                                       |            |                                                                  |

## vwscanw(3XCURSES)

**NAME** vwscanw – convert formatted input from a window

**SYNOPSIS**

```
cc [flag...] file... -I /usr/xpg4/include -L /usr/xpg4/lib \
-R /usr/xpg4/lib -lcurses [library...]

c89 [flag...] file... -lcurses [library...]

#include <varargs.h>
#include <curses.h>

int vwscanw(WINDOW *win, char *fmt, va_list varlist);
```

**PARAMETERS**

|                |                                                                  |
|----------------|------------------------------------------------------------------|
| <i>fmt</i>     | Is a scanf () format string.                                     |
| <i>varlist</i> | Is a pointer to a list of parameters.                            |
| <i>win</i>     | Is a pointer to the window in which the character is to be read. |

**DESCRIPTION** The vwscanw () function achieves the same effect as wscanw(3XCURSES) using a variable argument list. The third argument is a va\_list, as defined in <varargs.h>.

**RETURN VALUES** Upon successful completion, vwscanw () returns OK. Otherwise, it returns ERR.

**ERRORS** No errors are defined.

**USAGE** The vwscanw () function is deprecated; the vw\_scanw(3XCURSES) function is preferred. The use of the vwscanw () and vw\_scanw () in the same file will not work, due to the requirements to include <varargs.h> and <stdarg.h>, which both contain definitions of va\_list.

**ATTRIBUTES** See attributes(5) for descriptions of the following attributes:

| ATTRIBUTE TYPE      | ATTRIBUTE VALUE |
|---------------------|-----------------|
| Interface Stability | Standard        |
| MT-Level            | Unsafe          |

**SEE ALSO** libcurses(3XCURSES), mvscanw(3XCURSES), scanf(3C), vw\_scanw(3XCURSES), attributes(5), standards(5)

| <b>NAME</b>          | wunctrl – generate printable representation of a wide character                                                                                                                                                                                                                                                                                                                                 |                |                 |                     |          |          |        |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-----------------|---------------------|----------|----------|--------|
| <b>SYNOPSIS</b>      | <pre>cc [ flag... ] file... -I /usr/xpg4/include -L /usr/xpg4/lib \ -R /usr/xpg4/lib -lcurses [ library... ]  c89 [ flag... ] file... -lcurses [ library... ]  #include &lt;curses.h&gt;  wchar_t *wunctrl (cchar_t *wc);</pre>                                                                                                                                                                 |                |                 |                     |          |          |        |
| <b>PARAMETERS</b>    | <i>wc</i> Is a pointer to the wide character.                                                                                                                                                                                                                                                                                                                                                   |                |                 |                     |          |          |        |
| <b>DESCRIPTION</b>   | <p>The <code>wunctrl()</code> function converts the a wide character string that is a printable representation of the wide character <i>wc</i>.</p> <p>This function also performs the following processing on the input argument:</p> <ul style="list-style-type: none"> <li>■ Control characters are converted to the ^X notation</li> <li>■ Any rendition information is removed.</li> </ul> |                |                 |                     |          |          |        |
| <b>RETURN VALUES</b> | Upon successful completion, the <code>wunctrl()</code> function returns the generated string. Otherwise, it returns a null pointer.                                                                                                                                                                                                                                                             |                |                 |                     |          |          |        |
| <b>ERRORS</b>        | No errors are defined.                                                                                                                                                                                                                                                                                                                                                                          |                |                 |                     |          |          |        |
| <b>ATTRIBUTES</b>    | See <code>attributes(5)</code> for descriptions of the following attributes:                                                                                                                                                                                                                                                                                                                    |                |                 |                     |          |          |        |
|                      | <table border="1"> <thead> <tr> <th>ATTRIBUTE TYPE</th> <th>ATTRIBUTE VALUE</th> </tr> </thead> <tbody> <tr> <td>Interface Stability</td> <td>Standard</td> </tr> <tr> <td>MT-Level</td> <td>Unsafe</td> </tr> </tbody> </table>                                                                                                                                                                | ATTRIBUTE TYPE | ATTRIBUTE VALUE | Interface Stability | Standard | MT-Level | Unsafe |
| ATTRIBUTE TYPE       | ATTRIBUTE VALUE                                                                                                                                                                                                                                                                                                                                                                                 |                |                 |                     |          |          |        |
| Interface Stability  | Standard                                                                                                                                                                                                                                                                                                                                                                                        |                |                 |                     |          |          |        |
| MT-Level             | Unsafe                                                                                                                                                                                                                                                                                                                                                                                          |                |                 |                     |          |          |        |
| <b>SEE ALSO</b>      | <code>keyname(3XCURSES)</code> , <code>libcurses(3XCURSES)</code> , <code>unctrl(3XCURSES)</code> , <code>attributes(5)</code> , <code>standards(5)</code>                                                                                                                                                                                                                                      |                |                 |                     |          |          |        |

wunctrl(3XCURSES)

---

# Index

---

## A

- activate audio-visual alarm
  - beep, 35
  - flash, 35
- add a string of `wchar_t` characters to a curses window and advance cursor —
  - `curs_addwstr`, 68
- add a `wchar_t` character (with attributes) to a curses window and advance cursor —
  - `curs_addwch`, 63
- add string of `wchar_t` characters (and attributes) to a curses window —  `curs_addwchstr`, 66
- add a string of `wchar_t` characters to a curses window and advance cursor —
  - `curs_addwstr`
  - `addnwstr`, 68
- add a `wchar_t` character (with attributes) to a curses window and advance cursor —
  - `curs_addwch`
  - `addwch`, 63
- add string of `wchar_t` characters (and attributes) to a curses window —  `curs_addwchstr`
  - `addwchnstr`, 66
  - `addwchstr`, 66
- add a string of `wchar_t` characters to a curses window and advance cursor —
  - `curs_addwstr`
  - `addwstr`, 68
- add a `wchar_t` character (with attributes) to a curses window and advance cursor —
  - `curs_addwch`
  - `echowchar`, 63
- add a string of `wchar_t` characters to a curses window and advance cursor —
  - `curs_addwstr`
  - `mvaddnwstr`, 68
- add a `wchar_t` character (with attributes) to a curses window and advance cursor —
  - `curs_addwch`
  - `mvaddwch`, 63
- add string of `wchar_t` characters (and attributes) to a curses window —  `curs_addwchstr`
  - `mvaddwchnstr`, 66
  - `mvaddwchstr`, 66
- add a string of `wchar_t` characters to a curses window and advance cursor —
  - `curs_addwstr`
  - `mvaddwstr`, 68
  - `mvwaddnwstr`, 68
- add a `wchar_t` character (with attributes) to a curses window and advance cursor —
  - `curs_addwch`
  - `mvwaddwch`, 63
- add string of `wchar_t` characters (and attributes) to a curses window —  `curs_addwchstr`
  - `mvwaddwchnstr`, 66
  - `mvwaddwchstr`, 66
- add a string of `wchar_t` characters to a curses window and advance cursor —
  - `curs_addwstr`
  - `mvwaddwstr`, 68
  - `waddnwstr`, 68
- add a `wchar_t` character (with attributes) to a curses window and advance cursor —
  - `curs_addwch`

add a `wchar_t` character (with attributes) to a curses window and advance cursor —  
`curs_addwch` (Continued)  
   `waddwch`, 63  
 add string of `wchar_t` characters (and attributes) to a curses window — `curs_addwchstr`  
   `waddwchnstr`, 66  
   `waddwchstr`, 66  
 add a string of `wchar_t` characters to a curses window and advance cursor —  
   `curs_addwstr`  
   `waddwstr`, 68  
 add a `wchar_t` character (with attributes) to a curses window and advance cursor —  
   `curs_addwch`  
   `wechowchar`, 63  
 add a character (with rendition) to a window  
   — `addch`, 18  
   — `mvaddch`, 18  
   — `mvwaddch`, 18  
   — `waddch`, 18  
 add a complex character (with rendition) to a window  
   — `add_wch`, 26  
   — `mvadd_wch`, 26  
   — `mvwadd_wch`, 26  
   — `wadd_wch`, 26  
 add a complex character and refresh window  
   — `echo_wchar`, 188  
   — `wecho_wchar`, 188  
 add a multi-byte character string (without rendition) to a window  
   — `addnstr`, 22  
   — `addstr`, 22  
   — `mvaddnstr`, 22  
   — `mvaddstr`, 22  
   — `mvwaddstr`, 22  
   — `mwwaddnstr`, 22  
   — `waddnstr`, 22  
   — `waddstr`, 22  
 add a single-byte border to a window  
   — `border`, 40  
   — `box`, 40  
   — `wborder`, 40  
 add a single-byte character and refresh window  
   — `echochar`, 187  
   — `wechochar`, 187  
 add a wide-character string to a window  
   — `addnwstr`, 24  
   — `addwstr`, 24  
   — `mvaddnwstr`, 24  
   — `mvaddwstr`, 24  
   — `mvwaddnwstr`, 24  
   — `mvwaddwstr`, 24  
   — `waddnwstr`, 24  
   — `waddwstr`, 24  
 add character and refresh window  
   — `pecho_wchar`, 344  
   — `pechochar`, 344  
`add_wch` — add a complex character (with rendition) to a window, 26  
`add_wchnstr` — copy a string of complex characters (with renditions) to a window, 28  
`add_wchstr` — copy a string of complex characters (with renditions) to a window, 28  
`addch` — add a character (with rendition) to a window, 18  
`addchnstr` — copy a character string (with renditions) to a window, 20  
`addchstr` — copy a character string (with renditions) to a window, 20  
`addnstr` — add a multi-byte character string (without rendition) to a window, 22  
`addnwstr` — add a string of `wchar_t` characters to a curses window and advance cursor, 68  
`addnwstr` — add a wide-character string to a window, 24  
`addstr` — add a multi-byte character string (without rendition) to a window, 22  
`addwch` — add a `wchar_t` character (with attributes) to a curses window and advance cursor, 63  
`addwchnstr` — add string of `wchar_t` characters (and attributes) to a curses window, 66  
`addwchstr` — add string of `wchar_t` characters (and attributes) to a curses window, 66  
`addwstr` — add a string of `wchar_t` characters to a curses window and advance cursor, 68  
`addwstr` — add a wide-character string to a window, 24  
`adjcurspos` — moving the cursor by character, 69  
 ALE curses library, *See* curses library  
 apply padding information and output string  
   — `putp`, 348

apply padding information and output string  
(Continued)

- tputs, 348
- arc — graphics interface, 345
- attr\_get — control window attributes, 30
- attr\_off — control window attributes, 30
- attr\_on — control window attributes, 30
- attr\_set — control window attributes, 30
- attroff — change foreground window attributes, 32
- attroff — curses character and window attribute control routines, 70
- attron — change foreground window attributes, 32
- attron — curses character and window attribute control routines, 70
- attrset — change foreground window attributes, 32
- attrset — curses character and window attribute control routines, 70

## B

- baudrate — return terminal baud rate, 34
- beep — activate audio-visual alarm, 35
- bkgd — set or get the background character (and rendition) of window, 36
- bkgdset — set or get the background character (and rendition) of window, 36
- bkgnd — set or get the background character (and rendition) of window using a complex character, 38
- bkgndset — set or get the background character (and rendition) of window using a complex character, 38
- border — add a single-byte border to a window, 40
- border\_set — use complex characters (and renditions) to draw borders, 42
- box — add a single-byte border to a window, 40
- box — graphics interface, 345
- box\_set — use complex characters (and renditions) to draw borders, 42

## C

- call refresh on changes to window — immedok, 245
- can\_change\_color — manipulate color information, 44
- cbreak — set input mode controls, 47
- change foreground window attributes
  - attroff, 32
  - attron, 32
  - attrset, 32
  - wattroff, 32
  - wattron, 32
  - wattrset, 32
- change the rendition of characters in a window
  - chgat, 48
  - mvchgat, 48
  - mvwchgat, 48
  - wchgat, 48
- character based forms package, — forms, 218
- character based menus package, — menus, 309
- character based panels package, — panels, 337
- check for type-ahead characters — typeahead, 369
- chgat — change the rendition of characters in a window, 48
- circle — graphics interface, 345
- clear — clear a window, 50
- clear a window
  - clear, 50
  - erase, 50
  - wclear, 50
  - werase, 50
- clear to the end of a line
  - clrtoeol, 54
  - wclrtoeol, 54
- clear to the end of a window
  - clrtobot, 53
  - wclrtobot, 53
- clearok — set terminal output controls, 51
- closepl — graphics interface, 345
- closevt — graphics interface, 345
- clrtobot — clear to the end of a window, 53
- clrtoeol — clear to the end of a line, 54
- color\_content — manipulate color information, 44
- COLOR\_PAIR — manipulate color information, 44

COLOR\_PAIRS — manipulate color information, 44

color\_set — control window attributes, 30

COLORS — manipulate color information, 44

COLS — number of columns on terminal screen, 55

cont — graphics interface, 345

control flush of input and output on interrupt

- noqiflush, 327
- qiflush, 327

control window attributes

- attr\_get, 30
- attr\_off, 30
- attr\_on, 30
- attr\_set, 30
- color\_set, 30
- wattr\_get, 30
- wattr\_off, 30
- wattr\_on, 30
- wattr\_set, 30
- wcolor\_set, 30

control window refresh

- is\_linetouched, 268
- is\_wintouched, 268
- touchline, 268
- touchwin, 268
- untouchwin, 268
- wtouchln, 268

convert formatted input from a window — mvscanw, 320

convert formatted input from a window — mvwscanw, 320

convert formatted input from a window — scanw, 320

convert formatted input from a window — wscanw, 320

convert formatted input from a window — vwscanw, 378

copy overlapped windows — overlay, 330

copy overlapped windows — overwrite, 330

copy a character string (with renditions) to a window

- addchnstr, 20
- addchstr, 20
- mvaddchnstr, 20
- mvaddchstr, 20
- mvwaddchnstr, 20
- mvwaddchstr, 20

copy a character string (with renditions) to a window (Continued)

- waddchnstr, 20
- waddchstr, 20

copy a string of complex characters (with renditions) to a window

- add\_wchnstr, 28
- add\_wchstr, 28
- mvadd\_wchnstr, 28
- mvadd\_wchstr, 28
- mvwadd\_wchnstr, 28
- mvwadd\_wchstr, 28
- wadd\_wchnstr, 28
- wadd\_wchstr, 28

copywin — overlay or overwrite any portion of window, 56

create a new window or subwindow

- derwin, 182
- newwin, 182
- subwin, 182

create or refresh a pad or subpad

- newpad, 323
- pnoutrefresh, 323
- prefresh, 323
- subpad, 323

CRT handling and optimization package, — curses, 83

cur\_term — current terminal information, 173

current terminal information — cur\_term, 173

current window — curscr, 80

cur\_addwch — add a wchar\_t character (with attributes) to a curses window and advance cursor, 63

cur\_addwchstr — add string of wchar\_t characters (and attributes) to a curses window, 66

cur\_addwstr — add a string of wchar\_t characters to a curses window and advance cursor, 68

cur\_alecompat — moving the cursor by character, 69

cur\_attr — curses character and window attribute control routines, 70

- Attributes, 70

cur\_getwch — get (or push back) wchar\_t characters from curses terminal keyboard, 115

- Function Keys, 115

curs\_getwstr — get wchar\_t character strings from curses terminal keyboard, 120  
 curs\_inswch — insert a wchar\_t character before the character under the cursor in a curses window, 133  
 curs\_inswstr — insert wchar\_t string before character under the cursor in a curses window, 134  
 curs\_inwch — get a wchar\_t character and its attributes from a curses window, 136  
 curs\_inwchstr — get a string of wchar\_t characters (and attributes) from a curses window, 137  
 curs\_inwstr — get a string of wchar\_t characters from a curses window, 138  
 curs\_pad — create and display curses pads, 146  
 curs\_set — set visibility of cursor, 155  
 curscr — current window, 80  
 curses — CRT handling and optimization package, 83  
 curses — introduction and overview of X/Open Curses, 98  
 curses pads, create and display — curs\_pad, 146  
 curses — introduction and overview of X/Open Curses  
   Attributes, Color Pairs, and Renditions, 100  
   Complex Characters, 103  
   Data Types, 99  
   Display Operations, 103  
   Input Processing, 104  
 curses pads, create and display — curs\_pad  
   newpad, 146  
 curses — introduction and overview of X/Open Curses  
   Non-Spacing Characters, 102  
   Overlapping Windows, 103  
 curses pads, create and display — curs\_pad  
   pechochar, 146  
   pechowchar, 146  
   pnoutrefresh, 146  
   prefresh, 146  
 curses — introduction and overview of X/Open Curses  
   Screens, Windows, and Terminals, 99  
   Special Characters, 103  
 curses pads, create and display — curs\_pad  
   subpad, 146  
 curses, low-level routines  
   — curs\_kernel, 139  
   — curs\_set, 139  
   — def\_prog\_mode, 139  
   — def\_shell\_mode, 139  
   — getsyx, 139  
   — napms, 139  
   — reset\_prog\_mode, 139  
   — reset\_shell\_mode, 139  
   — resettty, 139  
   — ripoffline, 139  
   — savetty, 139  
   — setsyx, 139  
 curses bell and screen flash routines  
   — beep, 72  
   — curs\_beep, 72  
   — flash, 72  
 curses borders, horizontal and vertical lines, create  
   — border, 74  
   — box, 74  
   — curs\_border, 74  
   — wborder, 74  
   — whline, 74  
   — wvline, 74  
 curses character and window attribute control routines  
   — attroff, 70  
   — attron, 70  
   — attrset, 70  
   — curs\_attr, 70  
   — standend, 70  
   — standout, 70  
   — wattroff, 70  
   — wattron, 70  
   — wattrset, 70  
   — wstandend, 70  
   — wstandout, 70  
 curses color manipulation routines  
   — can\_change\_colors, 77  
   — color\_content, 77  
   — curs\_color, 77  
   — has\_colors, 77  
   — init\_color, 77  
   — init\_pair, 77  
   — pair\_content, 77

curses color manipulation routines (Continued)

— start\_color, 77

curses cursor and window coordinates

— curs\_getyx, 121

— getbegyx, 121

— getmaxyx, 121

— getparyx, 121

— getyx, 121

curses environment query routines

— baudrate, 158

— curs\_termattrs, 158

— erasechar, 158

— has\_ic, 158

— has\_il, 158

— killchar, 158

— longname, 158

— termattrs, 158

— termname, 158

curses interfaces to termcap library

— curs\_termcap, 160

— tgetent, 160

— tgetflag, 160

— tgetnum, 160

— tgetstr, 160

— tgoto, 160

— tputs, 160

curses interfaces to terminfo database

— curs\_terminfo, 162

— del\_curterm, 162

— mvcur, 162

— putp, 162

— restartterm, 162

— set\_curterm, 162

— setterm, 162

— setupterm, 162

— tigetflag, 162

— tigetnum, 162

— tigetstr, 162

— tparm, 162

— tputs, 162

— vidattr, 162

— vidputs, 162

curses library

*See also* form library, menu library, or panel

library

— adjcurspos, 69

— curs\_alecompat, 69

— movenextch, 69

curses library (Continued)

— moveprevch, 69

— wadjcurspos, 69

— wmovenextch, 69

— wmoveprevch, 69

curses miscellaneous utility routines

— curs\_util, 168

— delay\_output, 168

— filter, 168

— flushinp, 168

— getwin, 168

— keyname, 168

— putwin, 168

— unctrl, 168

— use\_env, 168

curses refresh control routines

— curs\_touch, 166

— is\_linetouched, 166

— is\_wintouched, 166

— touchline, 166

— touchwin, 166

— untouchwin, 166

— wtouchln, 166

curses screen, read/write from/to file

— curs\_scr\_dump, 152

— scr\_dump, 152

— scr\_init, 152

— scr\_restore, 152

— scr\_set, 152

curses screen initialization and manipulation routines

— curs\_initscr, 124

— delscreen, 124

— endwin, 124

— initscr, 124

— isendwin, 124

— newterm, 124

— set\_term, 124

curses soft label routines

— curs\_slk, 156

— slk\_attroff, 156

— slk\_attron, 156

— slk\_attrset, 156

— slk\_clear, 156

— slk\_init, 156

— slk\_label, 156

— slk\_noutrefresh, 156

— slk\_refresh, 156

curses soft label routines (Continued)

- slk\_restore, 156
- slk\_set, 156
- slk\_touch, 156

curses terminal input option control routines

- cbreak, 126
- curs\_inopts, 126
- echo, 126
- halfdelay, 126
- intrflush, 126
- keypad, 126
- meta, 126
- nocbreak, 126
- nodelay, 126
- noecho, 126
- noqiflush, 126
- noraw, 126
- notimeout, 126
- qiflush, 126
- raw, 126
- timeout, 126
- typeahead, 126
- wtimeout, 126

curses terminal keyboard

- curs\_getstr, 114
- getstr, 114
- mvgetstr, 114
- mvwgetstr, 114
- wgetnstr, 114
- wgetstr, 114

curses terminal keyboard, get characters

- curs\_getch, 109
- getch, 109
- mvgetch, 109
- mvwgetch, 109
- ungetch, 109
- wgetch, 109

curses terminal output option control routines

- clearok, 142
- curs\_outopts, 142
- idcok, 142
- idlok, 142
- immedok, 142
- leaveok, 142
- nl, 142
- nonl, 142
- scrolllok, 142
- setscreg, 142

curses terminal output option control routines (Continued)

- wsetscreg, 142

curses window, add character and advance

- cursor
- addch, 58
- curs\_addch, 58
- echochar, 58
- mvwaddch, 58
- waddch, 58
- wechochar, 58

curses window, add string of characters

- addchnstr, 61
- addchstr, 61
- curs\_addchstr, 61
- mvaddchnstr, 61
- mvaddchstr, 61
- mvwaddchnstr, 61
- mvwaddchstr, 61
- waddchnstr, 61
- waddchstr, 61

curses window, add string of characters and advance cursor

- addnstr, 62
- addstr, 62
- curs\_addstr, 62
- mvaddnstr, 62
- mvaddstr, 62
- mvwaddstr, 62
- waddnstr, 62
- waddstr, 62

curses window, clear all or part

- clear, 76
- clrtoobot, 76
- clrtoeol, 76
- curs\_clear, 76
- erase, 76
- wclear, 76
- wclrtoobot, 76
- wclrtoeol, 76
- werase, 76

curses window, convert formatted input

- curs\_scanw, 151
- mvscanw, 151
- mvwscanw, 151
- scanw, 151
- vwscanw, 151
- wscanw, 151

curses window, delete and insert lines

- `curs_deleteln`, 82
- `deleteln`, 82
- `insdelln`, 82
- `insertln`, 82
- `wdeleteln`, 82
- `winsdelln`, 82
- `winsertln`, 82

curses window, delete character under cursor

- `curs_delch`, 81
- `delch`, 81
- `mvdclch`, 81
- `mvwdclch`, 81
- `wdelch`, 81

curses window, get character and its attributes

- `curs_inch`, 122
- `inch`, 122
- `mvinch`, 122
- `mvwinch`, 122
- `winch`, 122

curses window, get string of characters

- `curs_inchstr`, 123
- `curs_instr`, 132
- `inchstr`, 123
- `inchstr`, 123
- `innstr`, 132
- `instr`, 132
- `mvinchstr`, 123
- `mvinchstr`, 123
- `mvinnstr`, 132
- `mvinstr`, 132
- `mvwinchnstr`, 123
- `mvwinchstr`, 123
- `mvwinnstr`, 132
- `mvwinstr`, 132
- `winchnstr`, 123
- `winchstr`, 123
- `winnstr`, 132
- `winstr`, 132

curses window, insert character before character under cursor

- `curs_insch`, 129
- `insch`, 129
- `mvinsch`, 129
- `mvwinsch`, 129
- `winsch`, 129

curses window, insert string before character under cursor

- `curs_instr`, 130
- `insnstr`, 130
- `instr`, 130
- `mvinsnstr`, 130
- `mvinsstr`, 130
- `mvwinsnstr`, 130
- `mvwinsstr`, 130
- `winsnstr`, 130
- `winsstr`, 130

curses window, scroll

- `curs_scroll`, 154
- `scl`, 154
- `scroll`, 154
- `wscrl`, 154

curses window background manipulation routines

- `bkgd`, 73
- `bkgdset`, 73
- `curs_bkgd`, 73
- `wbkgd`, 73
- `wbkgdset`, 73

curses window cursor

- `curs_move`, 141
- `move`, 141
- `wmove`, 141

curses windows, create

- `curs_window`, 170
- `delwin`, 170
- `derwin`, 170
- `dupwin`, 170
- `mvderwin`, 170
- `mvwin`, 170
- `newwin`, 170
- `subwin`, 170
- `syncok`, 170
- `wcursyncup`, 170
- `wsyncdown`, 170
- `wsyncup`, 170

curses windows, overlap and manipulate

- `copywin`, 145
- `curs_overlay`, 145
- `overlay`, 145
- `overwrite`, 145

curses windows, print formatted output

- `curs_printw`, 148
- `mvprintw`, 148

curses windows, print formatted output  
(Continued)

- mvwprintw, 148
- printw, 148
- vwprintw, 148
- wprintw, 148

curses windows and lines, refresh

- curs\_refresh, 149
- douupdate, 149
- redrawwin, 149
- refresh, 149
- wnoutrefresh, 149
- wredrawln, 149
- wrefresh, 149

## D

def\_prog\_mode — save/restore terminal modes, 174

def\_shell\_mode — save/restore terminal modes, 174

default window — stdscr, 361

del\_curterm — interfaces to the terminfo database, 177

delay\_output — delays output, 175

delays output — delay\_output, 175

delch — remove a character, 176

delete a window — delwin, 181

deleteln — remove a line, 179

delwin — delete a window, 181

derwin — create a new window or subwindow, 182

determine insert/delete character/line capability

- has\_ic, 239
- has\_il, 239

disable use of certain terminal capabilities — filter, 191

discard type-ahead characters — flushinp, 192

douupdate — refresh windows and lines, 184

duplicate a window — dupwin, 185

dupwin — duplicate a window, 185

## E

echo — enable/disable terminal echo, 186

echo\_wchar — add a complex character and refresh window, 188

echochar — add a single-byte character and refresh window, 187

echowchar — add a wchar\_t character (with attributes) to a curses window and advance cursor, 63

emulate the termcap database

- tgetent, 365
- tgetflag, 365
- tgetnum, 365
- tgetstr, 365
- tgoto, 365

enable/disable half-delay mode — halfdelay, 238

enable/disable hardware insert-character and delete-character features — idcok, 244

enable/disable keypad handling — keypad, 272

enable/disable meta keys — meta, 315

enable/disable newline control

- nl, 325
- nonl, 325

enable/disable terminal echo

- echo, 186
- noecho, 186

endwin — restore initial terminal environment, 189

erase — clear a window, 50

erase — graphics interface, 345

erasechar — return current ERASE or KILL characters, 190

erasewchar — return current ERASE or KILL characters, 190

## F

filter — disable use of certain terminal capabilities, 191

flash — activate audio-visual alarm, 35

enable or disable flush on interrupt — intrflush, 264

flushinp — discard type-ahead characters, 192

form library

*See also* curses library

forms — character based forms package, 218

- forms, application-specific routines
  - field\_init, 210
  - field\_term, 210
  - form\_hook, 210
  - form\_init, 210
  - form\_term, 210
  - set\_field\_init, 210
  - set\_field\_term, 210
  - set\_form\_init, 210
  - set\_form\_term, 210
- forms, associate application data
  - field\_userptr, 208
  - form\_field\_userptr, 208
  - form\_userptr, 222
  - set\_field\_userptr, 208
  - set\_form\_userptr, 222
- forms, command processor, — form\_driver, 195
- forms, connect fields
  - field\_count, 198
  - form\_field, 198
  - form\_fields, 198
  - move\_field, 198
  - set\_form\_fields, 198
- forms, create and destroy
  - form\_new, 212
  - free\_form, 212
  - new\_form, 212
- forms, format general appearance
  - field\_just, 202
  - form\_field\_just, 202
  - set\_field\_just, 202
- forms, format general display attributes
  - field\_back, 199
  - field\_fore, 199
  - field\_pad, 199
  - form\_field\_attributes, 199
  - set\_field\_back, 199
  - set\_field\_fore, 199
  - set\_field\_pad, 199
- forms, set current page and field
  - current\_field, 215
  - field\_index, 215
  - form\_page, 215
  - set\_current\_field, 215
  - set\_form\_page, 215
- forms, write/erase from associated subwindows
  - form\_post, 217
- forms, write/erase from associated subwindows (Continued)
  - post\_form, 217
  - unpost\_form, 217
- forms field, off-screen data ahead or behind
  - data\_ahead, 194
  - data\_behind, 194
  - form\_data, 194
- forms field attributes, set and get
  - field\_buffer, 200
  - field\_status, 200
  - form\_field\_buffer, 200
  - set\_field\_buffer, 200
  - set\_field\_status, 200
  - set\_max\_field, 200
- forms field characteristics
  - dynamic\_field\_info, 201
  - field\_info, 201
  - form\_field\_info, 201
- forms field data type validation
  - field\_arg, 209
  - field\_type, 209
  - form\_field\_validation, 209
  - set\_field\_type, 209
- forms field option routines
  - field\_opts, 204
  - field\_opts\_off, 204
  - field\_opts\_on, 204
  - form\_field\_opts, 204
  - set\_field\_opts, 204
- forms fields, create and destroy
  - dup\_field, 203
  - form\_field\_new, 203
  - free\_field, 203
  - link\_field, 203
  - new\_field, 203
- forms fieldtype routines
  - form\_fieldtype, 206
  - free\_fieldtype, 206
  - link\_fieldtype, 206
  - new\_fieldtype, 206
  - set\_fieldtype\_arg, 206
  - set\_fieldtype\_choice, 206
- forms option routines
  - form\_opts, 214
  - form\_opts\_off, 214
  - form\_opts\_on, 214
  - set\_form\_opts, 214

forms pagination  
 — form\_new\_page, 213  
 — new\_page, 213  
 — set\_new\_page, 213  
 forms window and subwindow association  
 routines  
 — form\_sub, 223  
 — form\_win, 223  
 — scale\_form, 223  
 — set\_form\_sub, 223  
 — set\_form\_win, 223  
 forms window cursor, position  
 — form\_cursor, 193  
 — pos\_form\_cursor, 193

## G

generate printable representation of a character  
 — unctrl, 370  
 generate printable representation of a wide  
 character — wunctrl, 379  
 get a string of wchar\_t characters (and  
 attributes) from a curses window —  
 curs\_inwchstr, 137  
 get a string of wchar\_t characters from a curses  
 window — curs\_inwstr, 138  
 get a wchar\_t character and its attributes from a  
 curses window — curs\_inwch, 136  
 get supported terminal video attributes —  
 termattrs, 363  
 get supported terminal video attributes —  
 term\_attrs, 363  
 get wchar\_t character strings from curses  
 terminal keyboard — curs\_getwstr, 120  
 getnwstr, 120  
 getwchar\_t character strings from curses  
 terminal keyboard — curs\_getwstr,  
 getwstr, 120  
 get a string of wchar\_t characters from a curses  
 window — curs\_inwstr  
 innwstr, 138  
 get a wchar\_t character and its attributes from a  
 curses window — curs\_inwch  
 inwch, 136  
 get a string of wchar\_t characters (and  
 attributes) from a curses window —  
 curs\_inwchstr

get a string of wchar\_t characters (and  
 attributes) from a curses window —  
 curs\_inwchstr (Continued)  
 inwchnstr, 137  
 inwchstr, 137  
 get a string of wchar\_t characters from a curses  
 window — curs\_inwstr  
 inwstr, 138  
 get wchar\_t character strings from curses  
 terminal keyboard — curs\_getwstr  
 mvgetnwstr, 120  
 mvgetwstr, 120  
 get a string of wchar\_t characters from a curses  
 window — curs\_inwstr  
 mvinnwstr, 138  
 get a wchar\_t character and its attributes from a  
 curses window — curs\_inwch  
 mvinwch, 136  
 get a string of wchar\_t characters (and  
 attributes) from a curses window —  
 curs\_inwchstr  
 mvinwchnstr, 137  
 mvinwchstr, 137  
 get a string of wchar\_t characters from a curses  
 window — curs\_inwstr  
 mvinnwstr, 138  
 get wchar\_t character strings from curses  
 terminal keyboard — curs\_getwstr  
 mvwgetnwstr, 120  
 mvwgetwstr, 120  
 get a string of wchar\_t characters from a curses  
 window — curs\_inwstr  
 mvwinnwstr, 138  
 get a wchar\_t character and its attributes from a  
 curses window — curs\_inwch  
 mvwinwch, 136  
 get a string of wchar\_t characters (and  
 attributes) from a curses window —  
 curs\_inwchstr  
 mvwinwchnstr, 137  
 mvwinwchstr, 137  
 get a string of wchar\_t characters from a curses  
 window — curs\_inwstr  
 mvwinwstr, 138  
 get wchar\_t character strings from curses  
 terminal keyboard — curs\_getwstr  
 wgetnwstr, 120  
 wgetwstr, 120

get a string of `wchar_t` characters from a curses window — `curs_inwstr`  
`winnwstr`, 138

get a `wchar_t` character and its attributes from a curses window — `curs_inwch`  
`winwch`, 136

get a string of `wchar_t` characters (and attributes) from a curses window — `curs_inwchstr`  
`winwchnstr`, 137  
`winwchstr`, 137

get a string of `wchar_t` characters from a curses window — `curs_inwstr`  
`winwstr`, 138

get (or push back) `wchar_t` characters from curses terminal keyboard  
— `curs_getwch`, 115  
— `getwch`, 115  
— `mvgetwch`, 115  
— `mvwgetwch`, 115  
— `ungetwch`, 115  
— `wgetwch`, 115

get a multibyte character string from terminal  
— `getnstr`, 231  
— `getstr`, 231  
— `mvgetnstr`, 231  
— `mvgetstr`, 231  
— `mvwgetnstr`, 231  
— `mvwgetstr`, 231  
— `wgetnstr`, 231  
— `wgetstr`, 231

get a single-byte character from terminal  
— `getch`, 226  
— `mvgetch`, 226  
— `mvwgetch`, 226  
— `wgetch`, 226

get a wide character from terminal  
— `get_wch`, 235  
— `mvget_wch`, 235  
— `mvwget_wch`, 235  
— `wget_wch`, 235

get a wide character string (with rendition) from a `cchar_t` — `getcchar`, 225

get a wide character string from terminal  
— `get_wstr`, 233  
— `getn_wstr`, 233  
— `mvget_wstr`, 233  
— `mvgetn_wstr`, 233

get a wide character string from terminal (Continued)  
— `mvwget_wstr`, 233  
— `mvwgetn_wstr`, 233  
— `wget_wstr`, 233  
— `wgetn_wstr`, 233

get cursor or window coordinates  
— `getbegyx`, 224  
— `getmaxyx`, 224  
— `getparyx`, 224  
— `getyx`, 224

`get_wch` — get a wide character from terminal, 235

`get_wstr` — get a wide character string from terminal, 233

`getbegyx` — get cursor or window coordinates, 224

`getbkgd` — set or get the background character (and rendition) of window, 36

`getbkgrnd` — set or get the background character (and rendition) of window using a complex character, 38

`getcchar` — get a wide character string (with rendition) from a `cchar_t`, 225

`getch` — get a single-byte character from terminal, 226

`getmaxyx` — get cursor or window coordinates, 224

`getn_wstr` — get a wide character string from terminal, 233

`getnstr` — get a multibyte character string from terminal, 231

`getnwstr` — get `wchar_t` character strings from curses terminal keyboard, 120

`getparyx` — get cursor or window coordinates, 224

`getstr` — get a multibyte character string from terminal, 231

`getwch` — get (or push back) `wchar_t` characters from curses terminal keyboard, 115

`getwin` — read a window from, and write a window to, a file, 237

`getwstr` — get `wchar_t` character strings from curses terminal keyboard, 120

`getyx` — get cursor or window coordinates, 224  
graphics interface  
— `arc`, 345  
— `box`, 345

graphics interface (Continued)

- circle, 345
- closepl, 345
- closevt, 345
- cont, 345
- erase, 345
- label, 345
- line, 345
- linemod, 345
- move, 345
- openpl, 345
- openvt, 345
- plot, 345
- point, 345
- space, 345

**H**

- halfdelay — enable/disable half-delay mode, 238
- has\_colors — manipulate color information, 44
- has\_ic — determine insert/delete character/line capability, 239
- has\_il — determine insert/delete character/line capability, 239
- hline — use single-byte characters (and renditions) to draw lines, 240
- hline\_set — use complex characters (and renditions) to draw lines, 242

**I**

- idcok — enable/disable hardware insert-character and delete-character features, 244
- idlok — set terminal output controls, 51
- immedok — call refresh on changes to window, 245
- in\_wch — retrieve a complex character (with rendition), 265
- in\_wchnstr — retrieve complex character string (with rendition), 266
- in\_wchstr — retrieve complex character string (with rendition), 266
- inch — return a single-byte character (with rendition), 246

- inchstr — retrieve a single-byte character string (with rendition), 247
- inchstr — retrieve a single-byte character string (with rendition), 247
- init\_color — manipulate color information, 44
- init\_pair — manipulate color information, 44
- initscr — screen initialization functions, 249
- innstr — retrieve a multibyte character string (without rendition), 251
- innwstr — get a string of wchar\_t characters from a curses window, 138
- innwstr — retrieve a wide character string (without rendition), 253
- ins\_nwstr — insert a wide character string, 260
- ins\_wch — insert a complex character, 262
- ins\_wstr — insert a wide character string, 260
- insch — insert a character, 255
- insdelln — insert/delete lines to/from the window, 256
- insert a wchar\_t character before the character under the cursor in a curses window — curs\_inswch, 133
- insert wchar\_t string before character under the cursor in a curses window — curs\_inswstr, 134
- inswstr, 134
- insert a wchar\_t character before the character under the cursor in a curses window — curs\_inswch
- inswch, 133
- insert wchar\_t string before character under the cursor in a curses window — curs\_inswstr
- inswstr, 134
- mvinswstr, 134
- insert a wchar\_t character before the character under the cursor in a curses window — curs\_inswch
- mvinswch, 133
- insert wchar\_t string before character under the cursor in a curses window — curs\_inswstr
- mvinswstr, 134
- mvwinswstr, 134
- insert a wchar\_t character before the character under the cursor in a curses window — curs\_inswch
- mvwinswch, 133
- insert wchar\_t string before character under the cursor in a curses window — curs\_inswstr

insert `wchar_t` string before character under the cursor in a curses window — `curs_inswstr` (Continued)

- `mvwinswstr`, 134
- `winswstr`, 134

insert a `wchar_t` character before the character under the cursor in a curses window — `curs_inswch`  
`winswch`, 133

insert `wchar_t` string before character under the cursor in a curses window — `curs_inswstr`  
`winswstr`, 134

insert a character

- `insch`, 255
- `mvinsch`, 255
- `mvwinsch`, 255
- `winsch`, 255

insert a complex character

- `ins_wch`, 262
- `mvins_wch`, 262
- `mvwins_wch`, 262
- `wins_wch`, 262

insert a line in a window

- `insertln`, 257
- `winsertln`, 257

insert a multibyte character string

- `insnstr`, 258
- `insstr`, 258
- `mvinsnstr`, 258
- `mvinsstr`, 258
- `mvwinsnstr`, 258
- `mvwinsstr`, 258
- `winsnstr`, 258
- `winsstr`, 258

insert a wide character string

- `ins_nwstr`, 260
- `ins_wstr`, 260
- `mvins_nwstr`, 260
- `mvins_wstr`, 260
- `mvwins_nwstr`, 260
- `mvwins_wstr`, 260
- `wins_nwstr`, 260
- `wins_wstr`, 260

insert/delete lines to/from the window

- `insdelln`, 256
- `winsdelln`, 256

`insertln` — insert a line in a window, 257

`insnstr` — insert a multibyte character string, 258

`insnwstr` — insert `wchar_t` string before character under the cursor in a curses window, 134

`insstr` — insert a multibyte character string, 258

`instr` — retrieve a multibyte character string (without rendition), 251

`inswch` — insert a `wchar_t` character before the character under the cursor in a curses window, 133

`inswstr` — insert `wchar_t` string before character under the cursor in a curses window, 134

interfaces to the terminfo database — `del_curterm`, 177

interfaces to the terminfo database — `restartterm`, 177

interfaces to the terminfo database — `setupterm`, 177

interfaces to the terminfo database — `set_curterm`, 177

`intrflush` — enable or disable flush on interrupt, 264

introduction and overview of X/Open Curses — `curses`, 98

`inwch` — get a `wchar_t` character and its attributes from a curses window, 136

`inwchnstr` — get a string of `wchar_t` characters (and attributes) from a curses window, 137

`inwchstr` — get a string of `wchar_t` characters (and attributes) from a curses window, 137

`inwstr` — get a string of `wchar_t` characters from a curses window, 138

`inwstr` — retrieve a wide character string (without rendition), 253

`is_linetouched` — control window refresh, 268

`is_wintouched` — control window refresh, 268

`isendwin` — restore initial terminal environment, 189

## K

`key_name` — return character string used as key name, 270

`keyname` — return character string used as key name, 270

keypad — enable/disable keypad handling, 272  
killchar — return current ERASE or KILL characters, 190  
killwchar — return current ERASE or KILL characters, 190

## L

label — graphics interface, 345  
leaveok — set terminal output controls, 51  
line — graphics interface, 345  
linemod — graphics interface, 345  
LINES — number of lines on terminal screen, 284  
longname — return full terminal type name, 285

## M

manipulate color information —  
  can\_change\_color, 44  
manipulate color information — COLORS, 44  
manipulate color information —  
  color\_content, 44  
manipulate color information —  
  COLOR\_PAIR, 44  
manipulate color information —  
  COLOR\_PAIRS, 44  
manipulate color information — has\_colors, 44  
manipulate color information — init\_color, 44  
manipulate color information — init\_pair, 44  
manipulate color information —  
  pair\_content, 44  
manipulate color information —  
  PAIR\_NUMBER, 44  
manipulate color information — start\_color, 44  
map area of parent window to subwindow —  
  mvderwin, 318  
menu library  
  *See also* curses library  
menus — character based menus package, 309  
menus, application-specific routines  
  — item\_init, 292  
  — item\_term, 292  
  — menu\_hook, 292

menus, application-specific routines  
(Continued)

  — menu\_init, 292  
  — menu\_term, 292  
  — set\_item\_init, 292  
  — set\_item\_term, 292  
  — set\_menu\_init, 292  
  — set\_menu\_term, 292  
menus, associate application data  
  — menu\_userptr, 313  
  — set\_menu\_userptr, 313  
menus, create and destroy  
  — free\_menu, 304  
  — menu\_new, 304  
  — new\_menu, 304  
menus, rows and columns  
  — menu\_format, 291  
  — set\_menu\_format, 291  
menus cursor  
  — menu\_cursor, 288  
  — pos\_menu\_cursor, 288  
menus display attributes  
  — menu\_attributes, 286  
  — menu\_back, 286  
  — menu\_fore, 286  
  — menu\_grey, 286  
  — menu\_pad, 286  
  — set\_menu\_back, 286  
  — set\_menu\_fore, 286  
  — set\_menu\_grey, 286  
  — set\_menu\_pad, 286  
menus from associated subwindows,  
  write/erase  
  — menu\_post, 308  
  — post\_menu, 308  
  — unpost\_menu, 308  
menus item, visibility  
  — item\_visible, 302  
  — menu\_item\_visible, 302  
menus item name and description  
  — item\_description, 296  
  — item\_name, 296  
  — menu\_item\_name, 296  
menus item options routines  
  — item\_opts, 298  
  — item\_opts\_off, 298  
  — item\_opts\_on, 298  
  — menu\_item\_opts, 298

menus item options routines (Continued)  
   — set\_item\_opts, 298  
 menus item values, set and get  
   — item\_value, 301  
   — menu\_item\_value, 301  
   — set\_item\_value, 301  
 menus items, associate application data  
   — item\_userptr, 300  
   — menu\_item\_userptr, 300  
   — set\_item\_userptr, 300  
 menus items, connect and disconnect  
   — item\_count, 299  
   — menu\_items, 299  
   — set\_menu\_items, 299  
 menus items, create and destroy  
   — free\_item, 297  
   — menu\_item\_new, 297  
   — new\_item, 297  
 menus items, get and set  
   — current\_item, 294  
   — item\_index, 294  
   — menu\_item\_current, 294  
   — set\_current\_item, 294  
   — set\_top\_row, 294  
   — top\_row, 294  
 menus mark string routines  
   — menu\_mark, 303  
   — set\_menu\_mark, 303  
 menus options routines  
   — menu\_opts, 305  
   — menu\_opts\_off, 305  
   — menu\_opts\_on, 305  
   — set\_menu\_opts, 305  
 menus pattern match buffer  
   — menu\_pattern, 307  
   — set\_menu\_pattern, 307  
 menus subsystem, command processor, —  
   menu\_driver, 289  
 menus window and subwindow association  
   routines  
   — menu\_sub, 314  
   — menu\_win, 314  
   — scale\_menu, 314  
   — set\_menu\_sub, 314  
   — set\_menu\_win, 314  
 meta — enable/disable meta keys, 315  
 move — graphics interface, 345  
 move — move cursor in window, 316  
   — move, 316  
   — wmove, 316  
 move the cursor — mvcur, 317  
 move window — mvwin, 321  
 movenextch — moving the cursor by  
   character, 69  
 moveprevch — moving the cursor by  
   character, 69  
 mvadd\_wch — add a complex character (with  
   rendition) to a window, 26  
 mvadd\_wchnstr — copy a string of complex  
   characters (with renditions) to a window, 28  
 mvadd\_wchstr — copy a string of complex  
   characters (with renditions) to a window, 28  
 mvaddch — add a character (with rendition) to  
   a window, 18  
 mvaddchnstr — copy a character string (with  
   renditions) to a window, 20  
 mvaddchstr — copy a character string (with  
   renditions) to a window, 20  
 mvaddnstr — add a multi-byte character string  
   (without rendition) to a window, 22  
 mvaddnwstr — add a string of wchar\_t  
   characters to a curses window and advance  
   cursor, 68  
 mvaddnwstr — add a wide-character string to a  
   window, 24  
 mvaddstr — add a multi-byte character string  
   (without rendition) to a window, 22  
 mvaddwch — add a wchar\_t character (with  
   attributes) to a curses window and advance  
   cursor, 63  
 mvaddwchnstr — add string of wchar\_t  
   characters (and attributes) to a curses  
   window, 66  
 mvaddwchstr — add string of wchar\_t  
   characters (and attributes) to a curses  
   window, 66  
 mvaddwstr — add a string of wchar\_t  
   characters to a curses window and advance  
   cursor, 68  
 mvaddwstr — add a wide-character string to a  
   window, 24  
 mvchgat — change the rendition of characters  
   in a window, 48  
 mvcur — move the cursor, 317  
 mvdelch — remove a character, 176

mvderwin — map area of parent window to subwindow, 318  
 mvget\_wch — get a wide character from terminal, 235  
 mvget\_wstr — get a wide character string from terminal, 233  
 mvgetch — get a single-byte character from terminal, 226  
 mvgetn\_wstr — get a wide character string from terminal, 233  
 mvgetnstr — get a multibyte character string from terminal, 231  
 mvgetnwstr — get wchar\_t character strings from curses terminal keyboard, 120  
 mvgetstr — get a multibyte character string from terminal, 231  
 mvgetwch — get (or push back) wchar\_t characters from curses terminal keyboard, 115  
 mvgetwstr — get wchar\_t character strings from curses terminal keyboard, 120  
 mvhline — use single-byte characters (and renditions) to draw lines, 240  
 mvhline\_set — use complex characters (and renditions) to draw lines, 242  
 mvin\_wch — retrieve a complex character (with rendition), 265  
 mvin\_wchnstr — retrieve complex character string (with rendition), 266  
 mvin\_wchstr — retrieve complex character string (with rendition), 266  
 mvinch — return a single-byte character (with rendition), 246  
 mvinchnstr — retrieve a single-byte character string (with rendition), 247  
 mvinchstr — retrieve a single-byte character string (with rendition), 247  
 mvinnstr — retrieve a multibyte character string (without rendition), 251  
 mvinnwstr — get a string of wchar\_t characters from a curses window, 138  
 mvinnwstr — retrieve a wide character string (without rendition), 253  
 mvins\_nwstr — insert a wide character string, 260  
 mvins\_wch — insert a complex character, 262  
 mvins\_wstr — insert a wide character string, 260  
 mvinsch — insert a character, 255  
 mvinsnstr — insert a multibyte character string, 258  
 mvinsnwstr — insert wchar\_t string before character under the cursor in a curses window, 134  
 mvinsstr — insert a multibyte character string, 258  
 mvinstr — retrieve a multibyte character string (without rendition), 251  
 mvinswch — insert a wchar\_t character before the character under the cursor in a curses window, 133  
 mvinswstr — insert wchar\_t string before character under the cursor in a curses window, 134  
 mvinwch — get a wchar\_t character and its attributes from a curses window, 136  
 mvinwchnstr — get a string of wchar\_t characters (and attributes) from a curses window, 137  
 mvinwchstr — get a string of wchar\_t characters (and attributes) from a curses window, 137  
 mvinwstr — get a string of wchar\_t characters from a curses window, 138  
 mvinwstr — retrieve a wide character string (without rendition), 253  
 mvprintw — print formatted output window, 319  
 mvscanw — convert formatted input from a window, 320  
 mvvline — use single-byte characters (and renditions) to draw lines, 240  
 mvvline\_set — use complex characters (and renditions) to draw lines, 242  
 mvwadd\_wch — add a complex character (with rendition) to a window, 26  
 mvwadd\_wchnstr — copy a string of complex characters (with renditions) to a window, 28  
 mvwadd\_wchstr — copy a string of complex characters (with renditions) to a window, 28  
 mvwaddch — add a character (with rendition) to a window, 18  
 mvwaddchnstr — copy a character string (with renditions) to a window, 20  
 mvwaddchstr — copy a character string (with renditions) to a window, 20

mvwaddnwstr — add a string of wchar\_t characters to a curses window and advance cursor, 68  
 mvwaddnwstr — add a wide-character string to a window, 24  
 mvwaddstr — add a multi-byte character string (without rendition) to a window, 22  
 mvwaddwch — add a wchar\_t character (with attributes) to a curses window and advance cursor, 63  
 mvwaddwchnstr — add string of wchar\_t characters (and attributes) to a curses window, 66  
 mvwaddwchstr — add string of wchar\_t characters (and attributes) to a curses window, 66  
 mvwaddwstr — add a string of wchar\_t characters to a curses window and advance cursor, 68  
 mvwaddwstr — add a wide-character string to a window, 24  
 mvwchgat — change the rendition of characters in a window, 48  
 mvwdelch — remove a character, 176  
 mvwget\_wch — get a wide character from terminal, 235  
 mvwget\_wstr — get a wide character string from terminal, 233  
 mvwgetch — get a single-byte character from terminal, 226  
 mvwgetn\_wstr — get a wide character string from terminal, 233  
 mvwgetnstr — get a multibyte character string from terminal, 231  
 mvwgetnwstr — get wchar\_t character strings from curses terminal keyboard, 120  
 mvwgetstr — get a multibyte character string from terminal, 231  
 mvwgetwch — get (or push back) wchar\_t characters from curses terminal keyboard, 115  
 mvwgetwstr — get wchar\_t character strings from curses terminal keyboard, 120  
 mvwhline — use single-byte characters (and renditions) to draw lines, 240  
 mvwhline\_set — use complex characters (and renditions) to draw lines, 242  
 mvwin — move window, 321  
 mvwin\_wch — retrieve a complex character (with rendition), 265  
 mvwin\_wchnstr — retrieve complex character string (with rendition), 266  
 mvwin\_wchstr — retrieve complex character string (with rendition), 266  
 mvwinch — return a single-byte character (with rendition), 246  
 mvwinchnstr — retrieve a single-byte character string (with rendition), 247  
 mvwinchstr — retrieve a single-byte character string (with rendition), 247  
 mvwinnstr — retrieve a multibyte character string (without rendition), 251  
 mvwinnwstr — get a string of wchar\_t characters from a curses window, 138  
 mvwinnwstr — retrieve a wide character string (without rendition), 253  
 mvwins\_nwstr — insert a wide character string, 260  
 mvwins\_wch — insert a complex character, 262  
 mvwins\_wstr — insert a wide character string, 260  
 mvwinsch — insert a character, 255  
 mvwinsnstr — insert a multibyte character string, 258  
 mvwinsnwstr — insert wchar\_t string before character under the cursor in a curses window, 134  
 mvwinsstr — insert a multibyte character string, 258  
 mvwinstr — retrieve a multibyte character string (without rendition), 251  
 mvwinswch — insert a wchar\_t character before the character under the cursor in a curses window, 133  
 mvwinswstr — insert wchar\_t string before character under the cursor in a curses window, 134  
 mvwinwch — get a wchar\_t character and its attributes from a curses window, 136  
 mvwinwchnstr — get a string of wchar\_t characters (and attributes) from a curses window, 137  
 mvwinwchstr — get a string of wchar\_t characters (and attributes) from a curses window, 137

mvwinwstr — get a string of `wchar_t` characters from a curses window, 138  
 mvwinwstr — retrieve a wide character string (without rendition), 253  
 mvwprintw — print formatted output window, 319  
 mvwscanw — convert formatted input from a window, 320  
 mvwvline — use single-byte characters (and renditions) to draw lines, 240  
 mvwvline\_set — use complex characters (and renditions) to draw lines, 242  
 mwwaddnstr — add a multi-byte character string (without rendition) to a window, 22

## N

napms — sleep process for a specified length of time, 322  
 newpad — create and display curses pads, 146  
 newpad — create or refresh a pad or subpad, 323  
 newterm — screen initialization functions, 249  
 newwin — create a new window or subwindow, 182  
 nl — enable/disable newline control, 325  
 nocbreak — set input mode controls, 47  
 nodelay — set blocking or non-blocking read, 326  
 noecho — enable/disable terminal echo, 186  
 nonl — enable/disable newline control, 325  
 noqiflush — control flush of input and output on interrupt, 327  
 noraw — set input mode controls, 47  
 notimeout — set timed blocking or non-blocking read, 328  
 number of columns on terminal screen — COLS, 55  
 number of lines on terminal screen — LINES, 284

## O

openpl — graphics interface, 345  
 openvt — graphics interface, 345  
 output attributes to the terminal — vidattr, 373

output attributes to the terminal — vidputs, 373  
 output attributes to the terminal — vid\_attr, 373  
 output attributes to the terminal — vid\_puts, 373  
 overlay — copy overlapped windows, 330  
 overlay or overwrite any portion of window — copywin, 56  
 overwrite — copy overlapped windows, 330

## P

pair\_content — manipulate color information, 44  
 PAIR\_NUMBER — manipulate color information, 44  
 panel library  
   *See also* curses library  
 panels — character based panels package, 337  
 panels, create and destroy  
   — del\_panel, 336  
   — new\_panel, 336  
   — panel\_new, 336  
 panels deck manipulation routines  
   — bottom\_panel, 340  
   — hide\_panel, 339  
   — panel\_hidden, 339  
   — panel\_show, 339  
   — panel\_top, 340  
   — show\_panel, 339  
   — top\_panel, 340  
 panels deck traversal primitives  
   — panel\_above, 334  
   — panel\_below, 334  
 panels panel, associate application data  
   — panel\_userptr, 342  
   — set\_panel\_userptr, 342  
 panels panel, get or set current window  
   — panel\_window, 343  
   — replace\_panel, 343  
 panels virtual screen refresh routine  
   — panel\_update, 341  
   — update\_panel, 341  
 panels window on virtual screen, move  
   — move\_panel, 335  
   — panel\_move, 335

pecho\_wchar — add character and refresh window, 344  
 pechochar — add character and refresh window, 344  
 pechochar — create and display curses pads, 146  
 pechowchar — create and display curses pads, 146  
 plot — graphics interface, 345  
     Link Editor, 346  
 pnoutrefresh — create and display curses pads, 146  
 pnoutrefresh — create or refresh a pad or subpad, 323  
 point — graphics interface, 345  
 prefresh — create and display curses pads, 146  
 prefresh — create or refresh a pad or subpad, 323  
 print formatted output window — mvprintw, 319  
 print formatted output window — mvwprintw, 319  
 print formatted output window — printw, 319  
 print formatted output window — wprintw, 319  
 print formatted output in window — vwprintw, 376  
 print formatted output in window — vw\_printw, 375  
 print formatted output in window — vw\_scanw, 377  
 printw — print formatted output window, 319  
 push character back onto the input queue — unget\_wch, 371  
     — ungetch, 371  
 putp — apply padding information and output string, 348  
 putwin — read a window from, and write a window to, a file, 237

## Q

qiflush — control flush of input and output on interrupt, 327

## R

raw — set input mode controls, 47  
 read a window from, and write a window to, a file — getwin, 237  
     — putwin, 237  
 redraw screen or portion of screen — redrawwin, 350  
     — wredrawln, 350  
 redrawwin — redraw screen or portion of screen, 350  
 refresh — refresh windows and lines, 184  
 refresh windows and lines — doupdate, 184  
     — refresh, 184  
     — wnoutrefresh, 184  
     — wrefresh, 184  
 remove a character — delch, 176  
     — mvdelch, 176  
     — mvwdelch, 176  
     — wdelch, 176  
 remove a line — deleteln, 179  
     — wdeleteln, 179  
 reserve screen line for dedicated purpose — ripoffline, 352  
 reset\_prog\_mode — save/restore terminal modes, 174  
 reset\_shell\_mode — save/restore terminal modes, 174  
 resetty — restore/save terminal modes, 351  
 restartterm — interfaces to the terminfo database, 177  
 restore initial terminal environment — endwin, 189  
     — isendwin, 189  
 restore/save terminal modes — resetty, 351  
     — savetty, 351  
 retrieve a complex character (with rendition) — in\_wch, 265  
     — mvin\_wch, 265  
     — mvwin\_wch, 265  
     — win\_wch, 265  
 retrieve a multibyte character string (without rendition) — innstr, 251

retrieve a multibyte character string (without rendition) (Continued)

- instr, 251
- mvinnstr, 251
- mvinstr, 251
- mvwinstr, 251
- winnstr, 251
- winstr, 251

retrieve a single-byte character string (with rendition)

- inchnstr, 247
- inchstr, 247
- mvinchnstr, 247
- mvinchstr, 247
- mvwinchnstr, 247
- mvwinchstr, 247
- winchnstr, 247
- winchstr, 247

retrieve a wide character string (without rendition)

- innwstr, 253
- inwstr, 253
- mvinnwstr, 253
- mvinwstr, 253
- mvwinnwstr, 253
- mvwinwstr, 253
- winnwstr, 253
- winwstr, 253

retrieve complex character string (with rendition)

- in\_wchnstr, 266
- in\_wchstr, 266
- mvin\_wchnstr, 266
- mvin\_wchstr, 266
- mvwin\_wchnstr, 266
- mvwin\_wchstr, 266
- win\_wchnstr, 266
- win\_wchstr, 266

return a single-byte character (with rendition)

- inch, 246
- mvinch, 246
- mvwinch, 246
- winch, 246

return character string used as key name

- key\_name, 270
- keyname, 270

return current ERASE or KILL characters

- erasechar, 190
- erasewchar, 190
- killchar, 190
- killwchar, 190

return full terminal type name —

- longname, 285

return terminal baud rate — baudrate, 34

return the value of a terminfo capability

- tigetflag, 367
- tigetnum, 367
- tigetstr, 367
- tparm, 367

return the value of the environmental variable

- TERM — termname, 364

ripoffline — reserve screen line for dedicated purpose, 352

## S

save/restore terminal modes

- def\_prog\_mode, 174
- def\_shell\_mode, 174
- reset\_prog\_mode, 174
- reset\_shell\_mode, 174

savetty — restore/save terminal modes, 351

scanw — convert formatted input from a window, 320

scr\_dump — write screen contents to/from a file, 353

scr\_init — write screen contents to/from a file, 353

scr\_restore — write screen contents to/from a file, 353

scr\_set — write screen contents to/from a file, 353

screen initialization functions

- initscr, 249
- newterm, 249

sclr — scroll a window, 354

scroll — scroll a window, 354

scroll a window

- sclr, 354
- scroll, 354
- wsclr, 354

scrollok — set terminal output controls, 51

set or get the background character (and rendition) of window — `bkgd`, 36  
 set or get the background character (and rendition) of window — `bkgdset`, 36  
 set or get the background character (and rendition) of window — `getbkgd`, 36  
 set or get the background character (and rendition) of window — `wbkgd`, 36  
 set or get the background character (and rendition) of window — `wbkgdset`, 36  
 set a `cchar_t` type character from a wide character and rendition — `setcchar`, 355  
 set blocking or non-blocking read — `nodelay`, 326  
 set/clear window attributes  
   — `standend`, 360  
   — `standout`, 360  
   — `wstandend`, 360  
   — `wstandout`, 360  
 set `curterm` — interfaces to the terminfo database, 177  
 set input mode controls  
   — `cbreak`, 47  
   — `nocbreak`, 47  
   — `noraw`, 47  
   — `raw`, 47  
 set or get the background character (and rendition) of window using a complex character  
   — `bkggrnd`, 38  
   — `bkggrndset`, 38  
   — `getbkggrnd`, 38  
   — `wbkggrnd`, 38  
   — `wbkggrndset`, 38  
   — `wgetbkggrnd`, 38  
 set `term` — switch between terminals, 356  
 set terminal output controls  
   — `clearok`, 51  
   — `idlok`, 51  
   — `leaveok`, 51  
   — `scrollok`, 51  
   — `setscreg`, 51  
   — `wsetscreg`, 51  
 set timed blocking or non-blocking read  
   — `notimeout`, 328  
   — `timeout`, 328  
   — `wtimeout`, 328  
 set visibility of cursor — `curs_set`, 155  
 setcchar — set a `cchar_t` type character from a wide character and rendition, 355  
 setscreg — set terminal output controls, 51  
 setupterm — interfaces to the terminfo database, 177  
 sleep process for a specified length of time — `napms`, 322  
 slk\_attr\_off — soft label functions, 358  
 slk\_attr\_on — soft label functions, 358  
 slk\_attr\_set — soft label functions, 358  
 slk\_attroff — soft label functions, 358  
 slk\_attron — soft label functions, 358  
 slk\_attrset — soft label functions, 358  
 slk\_clear — soft label functions, 358  
 slk\_color — soft label functions, 358  
 slk\_init — soft label functions, 358  
 slk\_label — soft label functions, 358  
 slk\_noutrefresh — soft label functions, 358  
 slk\_refresh — soft label functions, 358  
 slk\_restore — soft label functions, 358  
 slk\_set — soft label functions, 358  
 slk\_touch — soft label functions, 358  
 slk\_wset — soft label functions, 358  
 soft label functions — `slk_attroff`, 358  
 soft label functions — `slk_attron`, 358  
 soft label functions — `slk_attrset`, 358  
 soft label functions — `slk_attr_off`, 358  
 soft label functions — `slk_attr_on`, 358  
 soft label functions — `slk_attr_set`, 358  
 soft label functions — `slk_clear`, 358  
 soft label functions — `slk_color`, 358  
 soft label functions — `slk_init`, 358  
 soft label functions — `slk_label`, 358  
 soft label functions — `slk_noutrefresh`, 358  
 soft label functions — `slk_refresh`, 358  
 soft label functions — `slk_restore`, 358  
 soft label functions — `slk_set`, 358  
 soft label functions — `slk_touch`, 358  
 soft label functions — `slk_wset`, 358  
 space — graphics interface, 345  
 specify source of screen size information — `use_env`, 372  
 standend — curses character and window attribute control routines, 70  
 standend — set/clear window attributes, 360  
 standout — curses character and window attribute control routines, 70  
 standout — set/clear window attributes, 360

start\_color — manipulate color information, 44  
 stdscr — default window, 361  
 subpad — create and display curses pads, 146  
 subpad — create or refresh a pad or subpad, 323  
 subwin — create a new window or subwindow, 182  
 switch between terminals — set\_term, 356  
 synchronize window with its parents or children  
   — syncok, 362  
   — wcursyncup, 362  
   — wsyncdown, 362  
   — wsyncup, 362  
 syncok — synchronize window with its parents or children, 362

## T

term\_attrs — get supported terminal video attributes, 363  
 termattrs — get supported terminal video attributes, 363  
 termname — return the value of the environmental variable TERM, 364  
 tgetent — emulate the termcap database, 365  
 tgetflag — emulate the termcap database, 365  
 tgetnum — emulate the termcap database, 365  
 tgetstr — emulate the termcap database, 365  
 tgoto — emulate the termcap database, 365  
 tigetflag — return the value of a terminfo capability, 367  
 tigetnum — return the value of a terminfo capability, 367  
 tigetstr — return the value of a terminfo capability, 367  
 timeout — set timed blocking or non-blocking read, 328  
 touchline — control window refresh, 268  
 touchwin — control window refresh, 268  
 tparm — return the value of a terminfo capability, 367  
 tputs — apply padding information and output string, 348  
 typeahead — check for type-ahead characters, 369

## U

unctrl — generate printable representation of a character, 370  
 unget\_wch — push character back onto the input queue, 371  
 ungetch — push character back onto the input queue, 371  
 ungetwch — get (or push back) wchar\_t characters from curses terminal keyboard, 115  
 untouchwin — control window refresh, 268  
 use complex characters (and renditions) to draw borders  
   — border\_set, 42  
   — box\_set, 42  
   — wborder\_set, 42  
 use complex characters (and renditions) to draw lines  
   — hline\_set, 242  
   — mvhline\_set, 242  
   — mvvline\_set, 242  
   — mvwhline\_set, 242  
   — mvwvline\_set, 242  
   — vline\_set, 242  
   — whline\_set, 242  
   — wvline\_set, 242  
 use\_env — specify source of screen size information, 372  
 use single-byte characters (and renditions) to draw lines  
   — hline, 240  
   — mvhline, 240  
   — mvvline, 240  
   — mvwhline, 240  
   — mvwvline, 240  
   — vline, 240  
   — whline, 240  
   — wvline, 240

## V

vid\_attr — output attributes to the terminal, 373  
 vid\_puts — output attributes to the terminal, 373  
 vidattr — output attributes to the terminal, 373

vidputs — output attributes to the terminal, 373  
 vline — use single-byte characters (and renditions) to draw lines, 240  
 vline\_set — use complex characters (and renditions) to draw lines, 242  
 vwprintw — print formatted output in window, 376  
 vw\_printw — print formatted output in window, 375  
 vw\_scanw — print formatted output in window, 377  
 vwscanw — convert formatted input from a window, 378

## W

wadd\_wch — add a complex character (with rendition) to a window, 26  
 wadd\_wchnstr — copy a string of complex characters (with renditions) to a window, 28  
 wadd\_wchstr — copy a string of complex characters (with renditions) to a window, 28  
 waddch — add a character (with rendition) to a window, 18  
 waddchnstr — copy a character string (with renditions) to a window, 20  
 waddchstr — copy a character string (with renditions) to a window, 20  
 waddnstr — add a multi-byte character string (without rendition) to a window, 22  
 waddnwstr — add a string of wchar\_t characters to a curses window and advance cursor, 68  
 waddnwstr — add a wide-character string to a window, 24  
 waddstr — add a multi-byte character string (without rendition) to a window, 22  
 waddwch — add a wchar\_t character (with attributes) to a curses window and advance cursor, 63  
 waddwchnstr — add string of wchar\_t characters (and attributes) to a curses window, 66  
 waddwchstr — add string of wchar\_t characters (and attributes) to a curses window, 66

waddwstr — add a string of wchar\_t characters to a curses window and advance cursor, 68  
 waddwstr — add a wide-character string to a window, 24  
 wadjcurspos — moving the cursor by character, 69  
 wattr\_get — control window attributes, 30  
 wattr\_off — control window attributes, 30  
 wattr\_on — control window attributes, 30  
 wattr\_set — control window attributes, 30  
 wattroff — change foreground window attributes, 32  
 wattroff — curses character and window attribute control routines, 70  
 wattron — change foreground window attributes, 32  
 wattron — curses character and window attribute control routines, 70  
 wattrset — change foreground window attributes, 32  
 wattrset — curses character and window attribute control routines, 70  
 wbkgd — set or get the background character (and rendition) of window, 36  
 wbkgdset — set or get the background character (and rendition) of window, 36  
 wbkgdset — set or get the background character (and rendition) of window using a complex character, 38  
 wbkgdset — set or get the background character (and rendition) of window using a complex character, 38  
 wborder — add a single-byte border to a window, 40  
 wborder\_set — use complex characters (and renditions) to draw borders, 42  
 wchgat — change the rendition of characters in a window, 48  
 wclear — clear a window, 50  
 wclrtoebot — clear to the end of a window, 53  
 wclrtoeol — clear to the end of a line, 54  
 wcolor\_set — control window attributes, 30  
 wcursyncup — synchronize window with its parents or children, 362  
 wdelch — remove a character, 176  
 wdeleteln — remove a line, 179  
 wecho\_wchar — add a complex character and refresh window, 188

wechochar — add a single-byte character and refresh window, 187  
 wechowchar — add a `wchar_t` character (with attributes) to a curses window and advance cursor, 63  
 werase — clear a window, 50  
 wget\_wch — get a wide character from terminal, 235  
 wget\_wstr — get a wide character string from terminal, 233  
 wgetbkgrnd — set or get the background character (and rendition) of window using a complex character, 38  
 wgetch — get a single-byte character from terminal, 226  
 wgetn\_wstr — get a wide character string from terminal, 233  
 wgetnstr — get a multibyte character string from terminal, 231  
 wgetnwstr — get `wchar_t` character strings from curses terminal keyboard, 120  
 wgetstr — get a multibyte character string from terminal, 231  
 wgetwch — get (or push back) `wchar_t` characters from curses terminal keyboard, 115  
 wgetwstr — get `wchar_t` character strings from curses terminal keyboard, 120  
 whline — use single-byte characters (and renditions) to draw lines, 240  
 whline\_set — use complex characters (and renditions) to draw lines, 242  
 win\_wch — retrieve a complex character (with rendition), 265  
 win\_wchnstr — retrieve complex character string (with rendition), 266  
 win\_wchstr — retrieve complex character string (with rendition), 266  
 winch — return a single-byte character (with rendition), 246  
 winchnstr — retrieve a single-byte character string (with rendition), 247  
 winchstr — retrieve a single-byte character string (with rendition), 247  
 winnstr — retrieve a multibyte character string (without rendition), 251  
 winnwstr — get a string of `wchar_t` characters from a curses window, 138  
 winnwstr — retrieve a wide character string (without rendition), 253  
 wins\_nwstr — insert a wide character string, 260  
 wins\_wch — insert a complex character, 262  
 wins\_wstr — insert a wide character string, 260  
 winsch — insert a character, 255  
 winsdelln — insert/delete lines to/from the window, 256  
 winsertln — insert a line in a window, 257  
 winsnstr — insert a multibyte character string, 258  
 winsnwstr — insert `wchar_t` string before character under the cursor in a curses window, 134  
 winsstr — insert a multibyte character string, 258  
 winstr — retrieve a multibyte character string (without rendition), 251  
 winswch — insert a `wchar_t` character before the character under the cursor in a curses window, 133  
 winswstr — insert `wchar_t` string before character under the cursor in a curses window, 134  
 winwch — get a `wchar_t` character and its attributes from a curses window, 136  
 winwchnstr — get a string of `wchar_t` characters (and attributes) from a curses window, 137  
 winwchstr — get a string of `wchar_t` characters (and attributes) from a curses window, 137  
 winwstr — get a string of `wchar_t` characters from a curses window, 138  
 winwstr — retrieve a wide character string (without rendition), 253  
 wmove — move cursor in window, 316  
 wmovnextch — moving the cursor by character, 69  
 wmoveprevch — moving the cursor by character, 69  
 wnoutrefresh — refresh windows and lines, 184  
 wprintw — print formatted output window, 319  
 wredrawln — redraw screen or portion of screen, 350  
 wrefresh — refresh windows and lines, 184

write screen contents to/from a file  
— `scr_dump`, 353  
— `scr_init`, 353  
— `scr_restore`, 353  
— `scr_set`, 353

`wscanw` — convert formatted input from a window, 320

`wscrl` — scroll a window, 354

`wsetscrreg` — set terminal output controls, 51

`wstandend` — curses character and window attribute control routines, 70

`wstandend` — set/clear window attributes, 360

`wstandout` — curses character and window attribute control routines, 70

`wstandout` — set/clear window attributes, 360

`wsyncdown` — synchronize window with its parents or children, 362

`wsyncup` — synchronize window with its parents or children, 362

`wtimeout` — set timed blocking or non-blocking read, 328

`wtouchln` — control window refresh, 268

`wunctrl` — generate printable representation of a wide character, 379

`wvline` — use single-byte characters (and renditions) to draw lines, 240

`wvline_set` — use complex characters (and renditions) to draw lines, 242