

# 17 Keyboards and Downloadable Keyboard Definitions

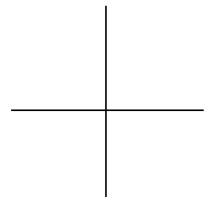
This chapter describes NCD-supported keyboards and downloadable keyboard files. For the N-97, N-101, VT220, N-108, N-107, and N-123 keyboard groups, there are illustrations showing keycap legends and associated decimal keycodes for the US version in each keyboard group, tables listing the keysyms that result when the terminal uses the default keymap for the US version in each group, default LED values, key combinations for accessing the Boot Monitor, and key combinations for accessing the Console from keyboards lacking a Setup key.

The following topics are described in this chapter:

- ❑ “Specifying the Keyboard Type” on page 17-2
- ❑ “N-97 Keyboard Details” on page 17-4
- ❑ “N-101 Keyboard Details” on page 17-13
- ❑ “VT220-Compatible and N-108 Keyboard Details” on page 17-21
- ❑ “N-107 Sun Type 4-Compatible Keyboard Details” on page 17-36
- ❑ “N-123 Sun Type 5-Compatible Keyboard Details” on page 17-44
- ❑ “Using Downloadable Keyboard Description Files” on page 17-54

This chapter does not describe keysyms for the foreign language versions of NCD keyboards. To see a keymap of a foreign language keyboard, use the X Window System utility *xmodmap*(1).

The *NCDware System Administrator’s Guide for UNIX Systems* and the *NCDware User’s Guide* describe concepts needed for understanding keyboard usage and keyboard attachment and configuration. The *System Administrator’s Guide* also shows how to use the X utilities such as *xmodmap* and *xev* for keyboard configuration.



## Specifying the Keyboard Type

The Boot Monitor senses the general type (group) of the keyboard attached to the terminal. It is only necessary to explicitly set the **keyboard-type** if you are using a keyboard that is not the US version (or the IBM PS/2 version for the N-101 group). If the terminal cannot sense the keyboard type, it defaults to the “IBM PS/2” type in the N-101/N-102 group.

The keyboard types in each keyboard group (for use with the **xserver-keyboard-type** parameter or in Setup Parameters ⇒ Input Devices ⇒ Keyboard Type) are listed in Table 17-1.

Table 17-1 Specifying Keyboards

Group	Keyboard Type	
Capella	“N-97”	
N-101/N-102	“N-101” “IBM PS/2” <sup>1</sup> “Belgian UK” “Belgian French” “English UK” “Canadian” “Canadian French CSA 1988” “Canadian French CSA 1992” “Danish” “Dutch” “Flemish” “French” “German”	“Icelandic” “Italian” “Norwegian” “Norwegian/Tandberg” “OADG Kana” “Portuguese” “Siemens German” “Spanish” “Spanish Latin America” “Swedish/Finnish” “Swiss French” “Swiss German”
VT-220	“VT220 US” “VT220 Canadian” “VT220 Danish” “VT220 Dutch” “VT220 Finnish” “VT220 Flemish” “VT220 French” “VT220 German” “VT220 Hebrew”	“VT220 Italian” “VT220 Norwegian” “VT220 Portuguese” “VT220 Spanish” “VT220 Swedish” “VT220 Swiss French” “VT220 Swiss German” “VT220 UK”

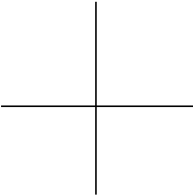
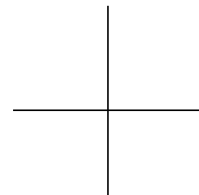


Table 17-1 Specifying Keyboards (Continued)

Group	Keyboard Type	
N-108	“N-108 US” “N-108 Belgian” “N-108 Canadian English” “N-108 Canadian French” “N-108 Danish” “N-108 Finnish” “N-108 French” “N-108 German”	“N-108 Italian” “N-108 Norwegian” “N-108 Portuguese” “N-108 Spanish” “N-108 Swedish” “N-108 Swiss French” “N-108 Swiss German” “N-108 UK”
Nokia 108	“108 US” “108 Belgian” “108 Canadian English” “108 Canadian French” “108 Danish” “108 Finnish” “108 French” “108 German”	“108 Italian” “108 Norwegian” “108 Portuguese” “108 Spanish” “108 Swedish” “108 Swiss French” “108 Swiss German” “108 UK”
Sun Type 4	“N-107 US”	
Sun Type 5	“N-123 North American” “N-123 Unix” “N-123 Danish” “N-123 Dutch” “N-123 French” “N-123 German” “N-123 Italian”	“N-123 Norwegian” “N-123 Portuguese” “N-123 Spanish” “N-123 Swedish” “N-123 Swiss French” “N-123 Swiss German” “N-123 UK”
Kana	“Kana”	
Nokia 122	“US 122”	
Hitachi Kana	“H-123”	
3270	“Lexmark-3270 US”	

<sup>1</sup> Use “IBM PS/2” for the Windows 95-compatible keyboard.



## N-97 Keyboard Details

The legends and keycodes for the US-type 97-key keyboard are illustrated in Figure 17-1. Table 17-2 lists the N-97 keysyms when the default mapping for the US type is in use.

The 97-key keyboards have three LEDs. Their default values are:

- LED1      Net on all HMX series, X1 on all Explora series
- LED2      Caps Lock
- LED3      x3

To access the Boot Monitor from an N-97 keyboard when the X server is running, use the Left Alt-Caps Lock-Setup key combination.

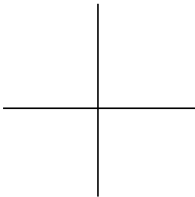




Figure 17-1 N-97 Keyboard Legends and Keycodes

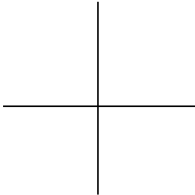


Table 17-2 N-97 Default Keymapping

Keycode Value	Keysym	Shifted Keysym
8	Escape	
9		
10		
11		
12		
13	Tab	
14	quoteleft	asciitilde
15	F2	
16	F1	
17	Control_L	
18	Shift_L	
19		
20	Caps_Lock	
21	q	Q
22	l	exclam
23	F3	
24		
25	Alt_L	Meta_L
26	z	Z
27	s	S
28	a	A
29	w	W

17-6 Keyboards and Downloadable Keyboard Definitions

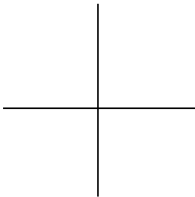


Table 17-2 N-97 Default Keymapping (Continued)

Keycode Value	Keysym	Shifted Keysym
30	2	at
31	F4	
32		
33	c	C
34	x	X
35	d	D
36	e	E
37	4	dollar
38	3	numbersign
39	F5	
40		
41	space	
42	v	V
43	f	F
44	t	T
45	r	R
46	5	percent
47	F6	
48		
49	n	N
50	b	B
51	h	H
52	g	G

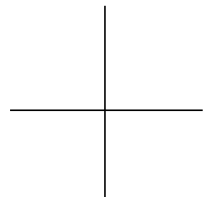


Table 17-2 N-97 Default Keymapping (Continued)

Keycode Value	Keysym	Shifted Keysym
53	y	Y
54	6	asciicircum
55	F7	
56		
57	Alt_R <sup>1</sup>	Meta_R <sup>1</sup>
58	m	M
59	j	J
60	u	U
61	7	ampersand
35	d	D
36	e	E
37	4	dollar
38	3	numbersign
39	F5	
40		
41	space	
42	v	V
43	f	F
44	t	T
45	r	R
46	5	percent
47	F6	
48		

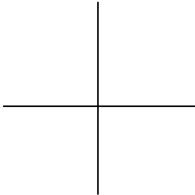




Table 17-2 N-97 Default Keymapping (Continued)

Keycode Value	Keysym	Shifted Keysym
49	n	N
50	b	B
51	h	H
52	g	G
53	y	Y
54	6	asciicircum
55	F7	
56		
57	Alt_R <sup>1</sup>	Meta_R <sup>1</sup>
58	m	M
59	j	J
60	u	U
61	7	ampersand
62	8	asterisk
63	F8	
64		
65	comma	less
66	k	K
67	i	I
68	o	O
69	0	parenright
70	9	parenleft
71	F9	

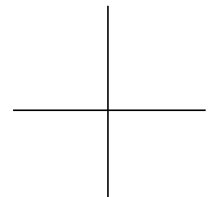


Table 17-2 N-97 Default Keymapping (Continued)

Keycode Value	Keysym	Shifted Keysym
72		
73	period	greater
74	slash	question
75	l	L
76	semicolon	colon
77	p	P
78	minus	underscore
79	F10	
80		
81		
82	quoteright	quotedbl
83		
84	bracketleft	braceleft
85	equal	plus
86	F11	
87	Linefeed	
88	Control_R <sup>1</sup>	
89	Shift_R <sup>1</sup>	
90	Return	
91	bracketright	braceright
92	backslash	bar
93		
94	F12	

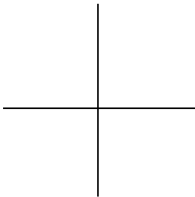


Table 17-2 N-97 Default Keymapping (Continued)

Keycode Value	Keysym	Shifted Keysym
95	Break	
96	Down	
97	Left	
98		
99	Up	
100	Delete	
101		
102	BackSpace	
103		
104		
105	KP_1	
106	Right	
107	KP_4	
108	KP_7	
109	KP_Separator	
110		
111		
112	KP_0	
113	KP_Decimal	
114	KP_2	
115	KP_5	
116	KP_6	
117	KP_8	

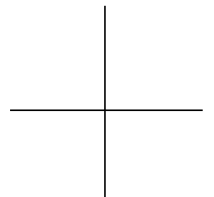
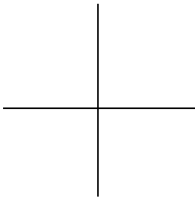


Table 17-2 N-97 Default Keymapping (Continued)

Keycode Value	Keysym	Shifted Keysym
118	KP_F1	
119	KP_F2	
120		
121	KP_Enter	
122	KP_3	
123		
124	KP_F4	
125	KP_9	
126	KP_F3	
127		
128		
129		
130		
131		
132	KP_Subtract	

<sup>1</sup> If the **pref-compatibility-decwindows-keyboard** parameter is set to “true,” this right modifier is translated to a left modifier.



# N-101 Keyboard Details

NCD has two US types of 101-key keyboards: the N-101 and the English US type. The English US is the same as the IBM PS/2 and the Windows 95-compatible (except for three Windows-specific keys).

Figure 17-2 illustrates the legends and keycodes for the N-101 type. The English US and Windows 95-compatible keyboards differ from the N-101 keyboard illustrated in Figure 17-2 as follows:

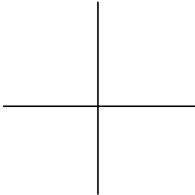
- ❑ The Caps Lock and Ctrl keys are swapped.
- ❑ The Line Feed key bears the legend “Print Screen.”
- ❑ The Break key bears the legend “Scroll Lock.”
- ❑ The Setup key bears the legend “Pause/Break.”
- ❑ The Return key bears the legend “Enter.”
- ❑ The Option key bears the label “Ctrl.”
- ❑ The Windows 95 keyboard has three additional keys: two “Windows” keys and one menu key.

Table 17-3 lists the N-101 and English US keysyms when default mapping is in effect.

The 101-key keyboards have three LEDs. Their default values are:

LED1	Net on all HMX series, X1 on all Explora series
LED2	Caps
LED3	Num

To access the Boot Monitor from an N-101 keyboard when the X server is running, use the Ctrl-Left Alt-Setup key combination. To access the Boot Monitor from the 102-key, English US, IBM/PS2, and Windows 95-compatible versions, use CapsLock-Left Alt-Setup.



N-101 Keyboard Details

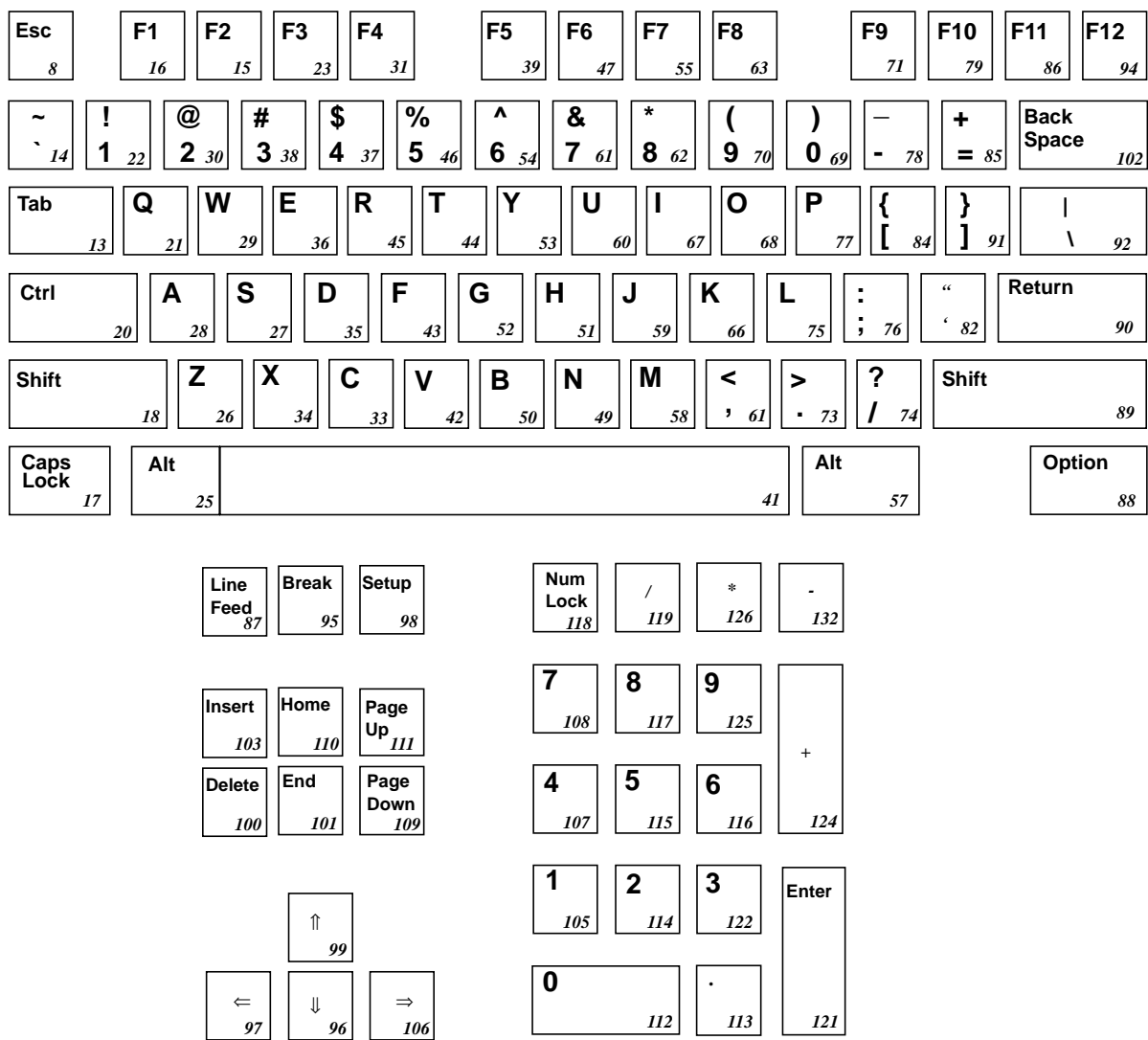


Figure 17-2 N-101 Default Keyboard Legends and Keycodes

17-14 Keyboards and Downloadable Keyboard Definitions

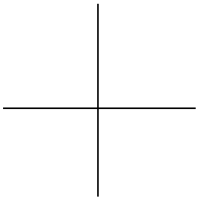


Table 17-3 N-101US and N-101PS Default Keymapping

Keycode Value	Keysyms	Shifted Keysyms
8	Escape	
9		
10		
11		
12		
13	Tab	
14	quoteleft	asciitilde
15	F2	
16	F1	
17	Caps_Lock (Control_L on the N-101PS and Windows 95-compatible)	
18	Shift_L	
19		
20	Control_L (Caps_Lock on the N-101PS and Windows 95-compatible)	
21	Q	
22	1	exclam
23	F3	
24		
25	Alt_L	Meta_L
26	Z	

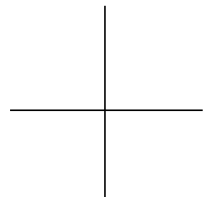


Table 17-3 N-101US and N-101PS Default Keymapping (Continued)

Keycode Value	Keysyms	Shifted Keysyms
27	S	
28	A	
29	W	
30	2	at
31	F4	
32		
33	C	
34	X	
35	D	
36	E	
37	4	dollar
38	3	numbersign
39	F5	
40		
41	space	
42	V	
43	F	
44	T	
45	R	
46	5	percent
47	F6	
48		
49	N	

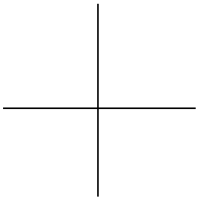




Table 17-3 N-101US and N-101PS Default Keymapping (Continued)

Keycode Value	Keysyms	Shifted Keysyms
50	B	
51	H	
52	G	
53	Y	
54	6	asciicircum
55	F7	
56		
57	Alt_R <sup>1</sup>	Meta_R <sup>1</sup>
58	M	
59	J	
60	U	
61	7	ampersand
62	8	asterisk
63	F8	
64		
65	comma	less
66	K	
67	I	
68	O	
69	0	parenright
70	9	parenleft
71	F9	
72		

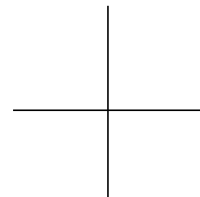


Table 17-3 N-101US and N-101PS Default Keymapping (Continued)

Keycode Value	Keysyms	Shifted Keysyms
73	period	greater
74	slash	question
75	L	
76	semicolon	colon
77	P	
78	minus	underscore
79	F10	
80		
81		
82	quoteright	quotedbl
83		
84	bracketleft	braceleft
85	equal	plus
86	F11	
87	Linefeed (Print Screen on the N-101PS and Windows 95-compatible)	
88	Control_R <sup>1</sup>	
89	Shift_R <sup>1</sup>	
90	Return	
91	bracketright	braceright
92	backslash	bar (unless bar and broken bar exist on same keyboard)

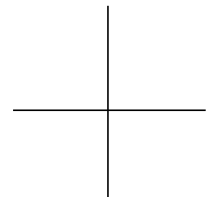


Table 17-3 N-101US and N-101PS Default Keymapping (Continued)

Keycode Value	Keysyms	Shifted Keysyms
93		
94	F12	
95	Break (Scroll Lock on the N-101PS and Windows 95-compatible)	
96	Down	
97	Left	
98	Setup	
99	Up	
100	Delete	
101	End	
102	Backspace	
103	Insert	
104		
105	KP_1	
106	Right	
107	KP_4	
108	KP_7	
109	Page Down	
110	Home	
111	Page Up	
112	KP_0	
113	KP_Decimal	

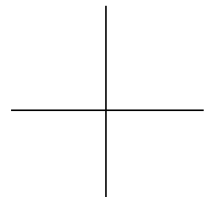
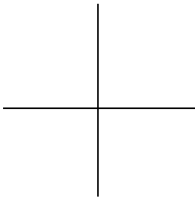


Table 17-3 N-101US and N-101PS Default Keymapping (Continued)

Keycode Value	Keysyms	Shifted Keysyms
114	KP_2	
115	KP_5	
116	KP_6	
117	KP_8	
118	Num_Lock	
119	KP_Divide	
120		
121	KP_Enter	
122	KP_3	
123		
124	KP_Add	
125	KP_9	
126	KP_Multiply	
127		
128		
129		
130		
131		
132	KP_Subtract	

<sup>1</sup> If the **pref-compatibility-decwindows-keyboard** parameter is set to true, this right modifier is translated to a left modifier.



## VT220-Compatible and N-108 Keyboard Details

The VT220-compatible keyboard and N-108 keyboard are Digital-style keyboards that may be used with either VMS or ULTRIX keymaps. The default keymap differs depending on whether the server host is running the VMS or ULTRIX operating system. (See Table 17-4 and Table 17-5.)

### VT220-Compatible Keyboard

Figure 17-3 illustrates the legends and keycodes on the US type of the VT220-compatible keyboard. The VT220-compatible keyboard has four LEDs. Their default values are:

LED1	Net on all HMX series, X1 on all Explora series
LED2	Caps
LED3	x2
LED4	x4

The Setup key combination for the VT220-compatible keyboard is Compose-F3. To access the Boot Monitor from a VT220-compatible keyboard after booting, use the Ctrl-Compose-F3 key combination.

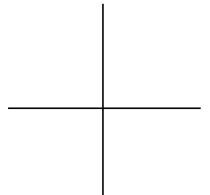
### N-108 Keyboard

Figure 17-4 illustrates the legends and keycodes of the N-108 keyboard.

The 108-key keyboards have four LEDs. Their default values are:

LED1	Net on all HMX series, X1 on all Explora series
LED2	x2
LED3	Caps Lock
LED4	x4

The Setup key combination for an N-108 keyboard is Alt-F3. To access the Boot Monitor from an N-108 keyboard after booting, use the Ctrl-Left Alt-F3 key combination.



VT220-Compatible and N-108 Keyboard Details

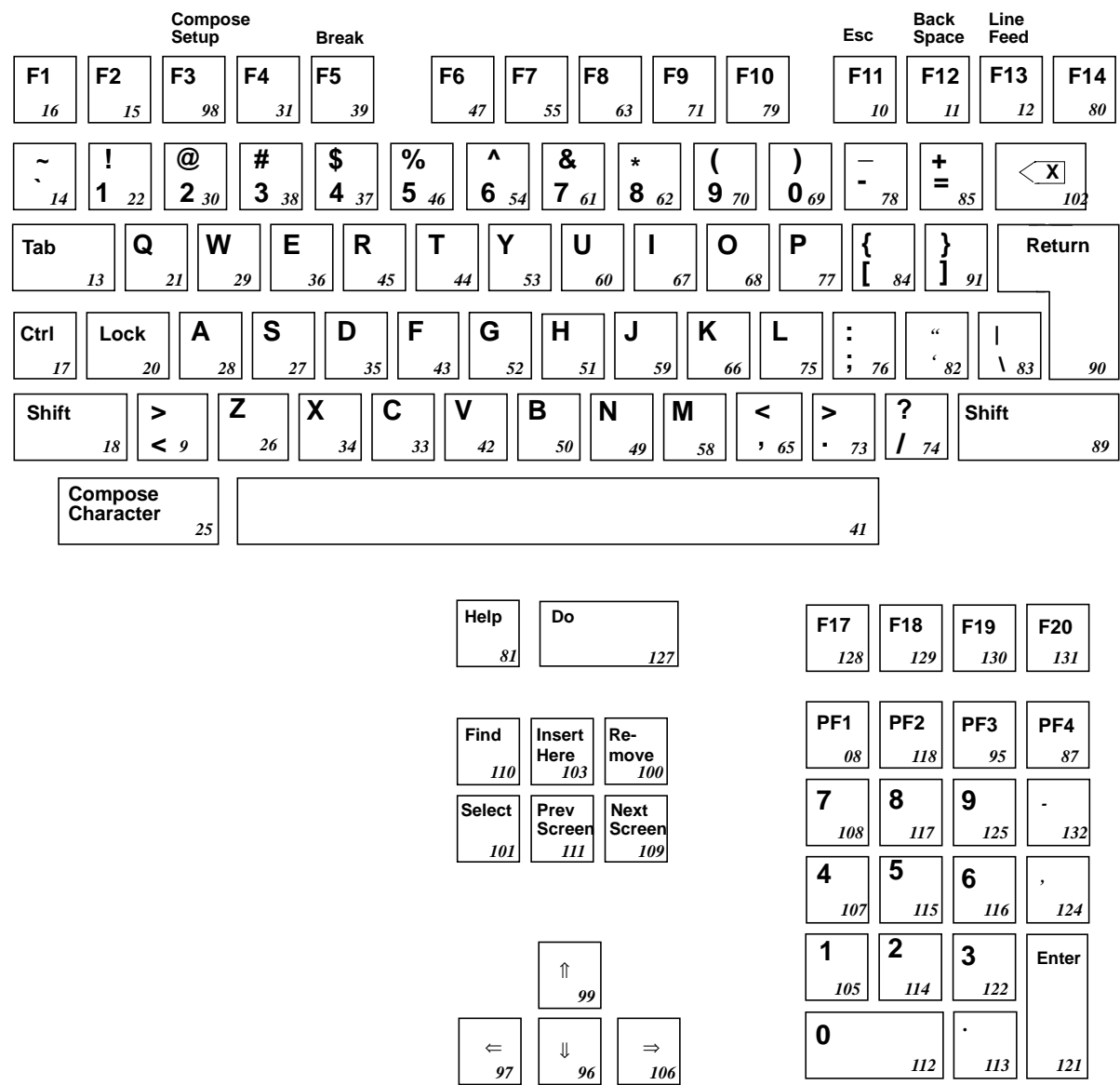
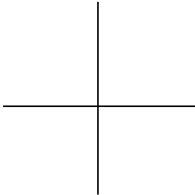


Figure 17-3 VT220-Compatible Keyboard Legends and Keycodes

17-22 Keyboards and Downloadable Keyboard Definitions



## VT220-Compatible and N-108 Keyboard Details

Compose Setup					Break					Esc					Back Space		Line Feed				
F1 16	F2 15	F3 98	F4 31	F5 39	F6 47	F7 55	F8 63	F9 71	F10 79	F11 10	F12 11	F13 12	F14 80								
~ 14	! 22	@ 30	# 38	\$ 37	% 46	^ 54	& 61	* 62	( 70	) 69	- 78	+ 85	X 102								
Tab 13	Q 21	W 29	E 36	R 45	T 44	Y 53	U 60	I 67	O 68	P 77	{ 84	} 91	Return 90								
Ctrl 17	Lock 20	A 28	S 27	D 35	F 43	G 52	H 51	J 59	K 66	L 75	: 76	“ 82	 83			90					
Shift 18	> 9	Z 26	X 34	C 33	V 42	B 50	N 49	M 58	< 65	> 73	? 74	Shift 89									
Compose Character 119	Alt 25	41										Alt 57	Compose Character 120								
					Help 81	Do 127						F17 128	F18 129	F19 130	F20 131						
					Find 110	Insert Here 103	Re-move 100						PF1 8	PF2 118	PF3 95	PF4 87					
					Select 101	Prev 111	Next 109						7 108	8 117	9 125	- 132					
															4 107	5 115	6 116	, 124			
															1 105	2 114	3 122	Enter 121			
															0 112	. 113					

Table 17-4 VT220-Compatible/N-108 Default Keysyms for ULTRIX

Keycode Value	Keysym	Shifted Keysym
8	KP_PF1	
9	less	greater
10	Escape	
11	Backspace	
12	Linefeed	
13	Tab	
14	quoteleft	asciitilde
15	F2	
16	F1	
17	Control_L	
18	Shift_L	
19		
20	Caps_Lock	
21	Q	
22	1	exclam
23		
24		
25	Alt_L	Meta_L
26	Z	
27	S	
28	A	
29	W	

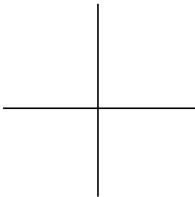
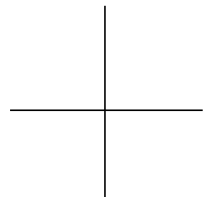




Table 17-4 VT220-Compatible/N-108 Default Keysyms for ULTRIX (Continued)

Keycode Value	Keysym	Shifted Keysym
30	2	at
31	F4	
32		
33	C	
34	X	
35	D	
36	E	
37	4	dollar
38	3	numbersign
39	F5	
40		
41	space	
42	V	
43	F	
44	T	
45	R	
46	5	percent
47	F6	
48		
49	N	
50	B	
51	H	
52	G	



**Table 17-4 VT220-Compatible/N-108 Default Keysyms for ULTRIX (Continued)**

Keycode Value	Keysym	Shifted Keysym
53	Y	
54	6	asciicircum
55	F7	
56		
57	Alt_R <sup>1 2</sup>	Meta_R <sup>1 2</sup>
58	M	
59	J	
60	U	
61	7	ampersand
62	8	asterisk
63	F8	
64		
65	comma	less
66	K	
67	I	
68	O	
69	0	parenright
70	9	parenleft
71	F9	
72		
73	period	greater
74	slash	question
75	L	

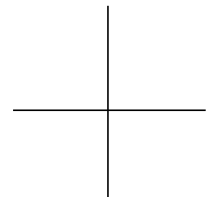
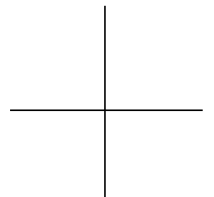


Table 17-4 VT220-Compatible/N-108 Default Keysyms for ULTRIX (Continued)

Keycode Value	Keysym	Shifted Keysym
76	semicolon	colon
77	P	
78	minus	underscore
79	F10	
80	F14	
81	Help	
82	quoteright	quotedbl
83	backslash	bar
84	bracketleft	braceleft
85	equal	plus
86		
87	KP_F4	
88		
89	Shift_R <sup>1</sup>	
90	Return	
91	bracketright	braceright
92		
93		
94		
95	KP_F3	
96	Down	
97	Left	
98	F3	



**Table 17-4 VT220-Compatible/N-108 Default Keysyms for ULTRIX (Continued)**

Keycode Value	Keysym	Shifted Keysym
99	Up	
100	Remove	
101	Select	
102	Delete	
103	Insert	
104		
105	KP_1	
106	Right	
107	KP_4	
108	KP_7	
109	Next	
110	Find	
111	Prior	
112	KP_0	
113	KP_Decimal	
114	KP_2	
115	KP_5	
116	KP_6	
117	KP_8	
118	KP_F2	
119	Multi_Key <sup>2</sup>	
120	Multi_Key <sup>2</sup>	
121	KP_Enter	

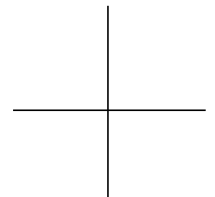


Table 17-4 VT220-Compatible/N-108 Default Keysyms for ULTRIX (Continued)

Keycode Value	Keysym	Shifted Keysym
122	KP_3	
123		
124	KP_Separator	
125	KP_9	
126		
127	Menu	
128	F17	
129	F18	
130	F19	
131	F20	
132	KP_Subtract	

<sup>1</sup> If the **pref-compatibility-decwindows-keyboard** parameter is set to “true,” this right modifier is translated to a left modifier.

<sup>2</sup> This keysym exists only for the N-108 keyboard.

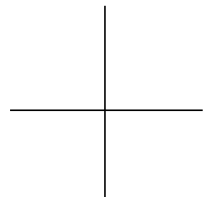


Table 17-5 VT220-Compatible/N-108 Keysyms for VMS

Keycode Value	Keysym	Shifted Keysym
8	KP_PF1	
9	less	greater
10	F11	
11	F12	
12	F13	
13	Tab	
14	quoteleft	asciitilde
15	F2	
16	F1	
17	Control_L	
18	Shift_L	
19		
20	Caps_Lock	
21	Q	
22	1	exclam
23		
24		
25	Alt_L	Meta_L
26	Z	
27	S	
28	A	
29	W	
30	2	at

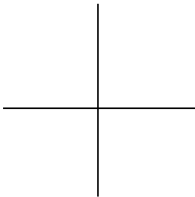


Table 17-5 VT220-Compatible/N-108 Keysyms for VMS (Continued)

Keycode Value	Keysym	Shifted Keysym
31	F4	
32		
33	C	
34	X	
35	D	
36	E	
37	4	dollar
38	3	numbersign
39	F5	
40		
41	space	
42	V	
43	F	
44	T	
45	R	
46	5	percent
47	F6	
48		
49	N	
50	B	
51	H	
52	G	
53	Y	

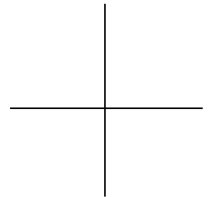


Table 17-5 VT220-Compatible/N-108 Keysyms for VMS (Continued)

Keycode Value	Keysym	Shifted Keysym
54	6	asciicircum
55	F7	
56		
57	Alt_R <sup>1 2</sup>	Meta_R <sup>1 2</sup>
58	M	
59	J	
60	U	
61	7	ampersand
62	8	asterisk
63	F8	
64		
65	comma	less
66	K	
67	I	
68	O	
69	0	parenright
70	9	parenleft
71	F9	
72		
73	period	greater
74	slash	question
75	L	
76	semicolon	colon

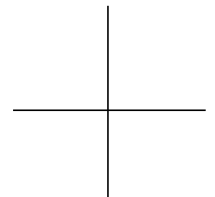




Table 17-5 VT220-Compatible/N-108 Keysyms for VMS (Continued)

Keycode Value	Keysym	Shifted Keysym
77	P	
78	minus	underscore
79	F10	
80	F14	
81	Help	
82	quoteright	quotedbl
83	backslash	bar
84	bracketleft	braceleft
85	equal	plus
86		
87	KP_F4	
88		
89	Shift_R <sup>1</sup>	
90	Return	
91	bracketright	braceright
92		
93		
94		
95	KP_F3	
96	Down	
97	Left	
98	F3	
99	Up	

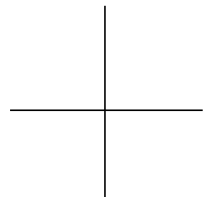


Table 17-5 VT220-Compatible/N-108 Keysyms for VMS (Continued)

Keycode Value	Keysym	Shifted Keysym
100	Remove	
101	Select	
102	Delete	
103	Insert	
104		
105	KP_1	
106	Right	
107	KP_4	
108	KP_7	
109	Next	
110	Find	
111	Prior	
112	KP_0	
113	KP_Decimal	
114	KP_2	
115	KP_5	
116	KP_6	
117	KP_8	
118	KP_F2	
119	Multi_key†	
120	Multi_key†	
121	KP_Enter	
122	KP_3	

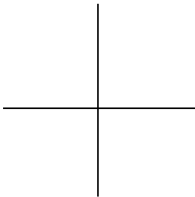
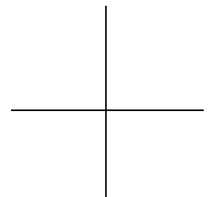


Table 17-5 VT220-Compatible/N-108 Keysyms for VMS (Continued)

Keycode Value	Keysym	Shifted Keysym
123		
124	KP_Separator	
125	KP_9	
126		
127	Menu	
128	F17	
129	F18	
130	F19	
131	F20	
132	KP_Subtract	

<sup>1</sup> If the **pref-compatibility-decwindows-keyboard** parameter is set to “true,” this right modifier is translated to a left modifier.

<sup>2</sup> This keysym exists only for the N-108 keyboard.

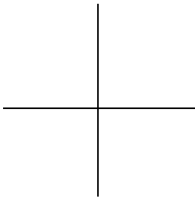


## N-107 Sun Type 4-Compatible Keyboard Details

Figure 17-5 illustrates the N-107 keyboard legends and keycodes.  
Table 17-6 lists the N-107 keysyms when the default mapping is in use.  
An N-107 keyboard has four LEDs built into keycaps. Their default values are:

LED1	Net on HMX series, X1 on all Explora series
LED2	Num Lock
LED3	Caps Lock
LED4	x4

To access the Boot Monitor from the N-107 keyboard after booting, use the Stop-A (L1-A) key combination.  
The Setup key combination for the N-107 keyboard is Alt Graph Help/Setup.



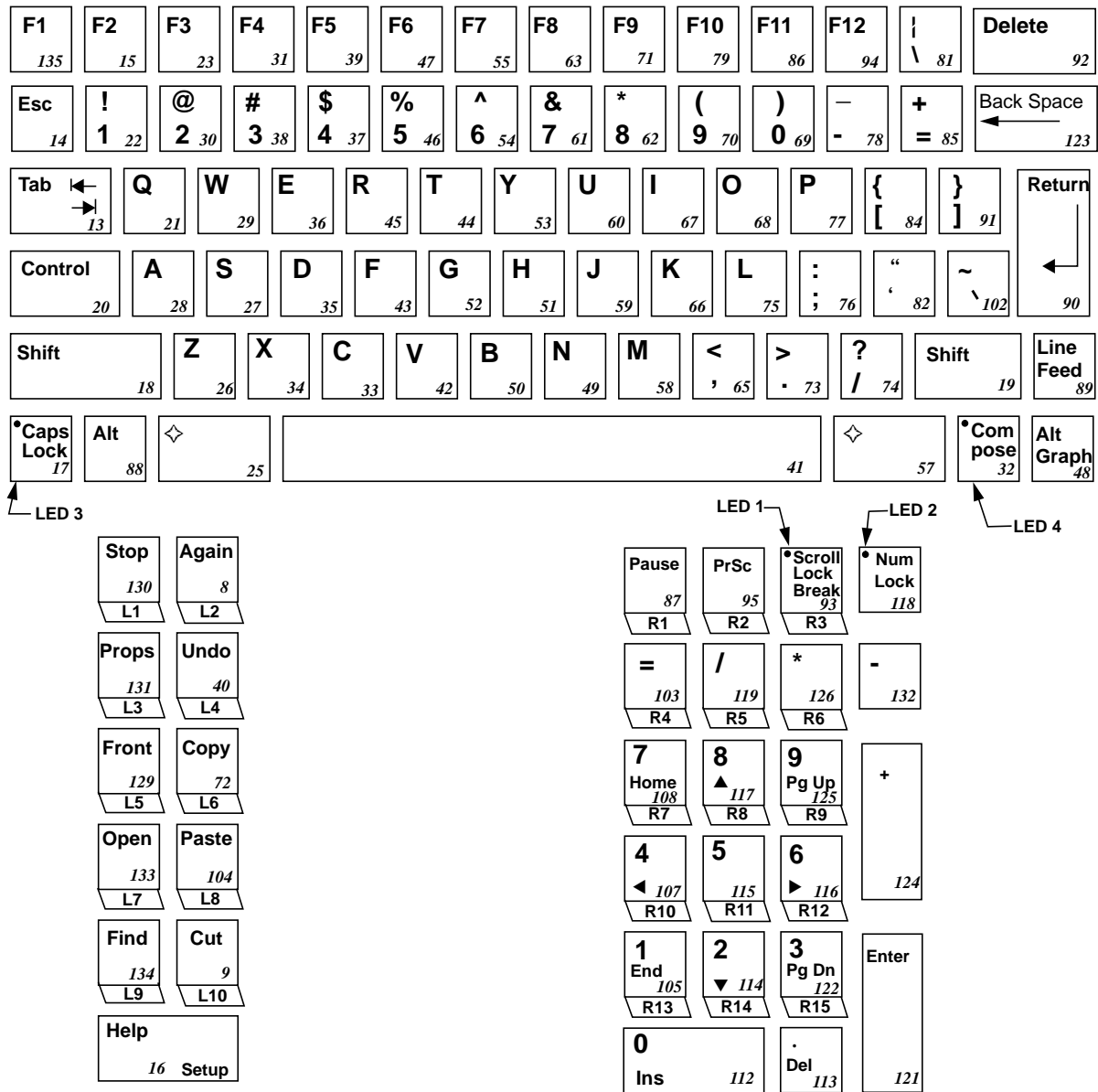


Figure 17-5 N-107 Default Keyboard Legends and Keycodes

Table 17-6 N-107 Default Keymapping

Keycode Value	Keysym	Shifted Keysym	Alt Keysym	Shifted Alt Keysym
8 <sup>1</sup>	F12	F12	Redo	
9	F20	F20	SunCut	
10				
11				
12				
13	Tab			
14	Escape			
15	F2			
16	Help			
17	Caps_Lock			
18	Shift_L			
19	Shift_R			
20	Control_L			
21	Q			
22	1	exclam		
23	F3			
24				
25	Meta_L			
26	Z			
27	X			
28	A			
29	W			

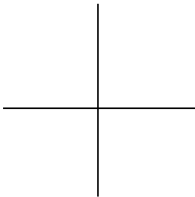


Table 17-6 N-107 Default Keymapping (Continued)

Keycode Value	Keysym	Shifted Keysym	Alt Keysym	Shifted Alt Keysym
30	2	at		
31	F4			
32	Multi_key			
33	C			
34	X			
35	D			
36	E			
37	4	dollar		
38	3	numbersign		
39	F5			
40	F14	F14	Undo	
41	Space			
42	V			
43	F			
44	T			
45	R			
46	5	percent		
47	F6			
48	Mode_switch			
49	N			
50	B			
51	H			
52	G			

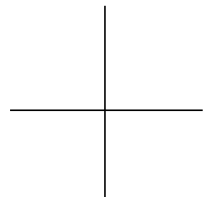


Table 17-6 N-107 Default Keymapping (Continued)

Keycode Value	Keysym	Shifted Keysym	Alt Keysym	Shifted Alt Keysym
53	Y			
54	6	asciicircum		
55	F7			
56				
57	Meta_R			
58	M			
59	J			
60	U			
61	7	ampersand		
62	8	asterisk		
63	F8			
64				
65	comma	less		
66	K			
67	I			
68	O			
69	0	parenright		
70	9	parenleft		
71	F9			
72	F16	F16	SunCopy	
73	period	greater		
74	slash	question		
75	L			

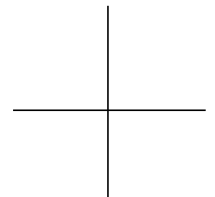




Table 17-6 N-107 Default Keymapping (Continued)

Keycode Value	Keysym	Shifted Keysym	Alt Keysym	Shifted Alt Keysym
76	semicolon	colon		
77	P			
78	minus	underscore		
79	F10			
80				
81	backslash	bar		
82	quoteleft	quotedbl		
83				
84	bracketleft	braceleft		
85	equal	plus		
86 <sup>1</sup>	SunF36			
87	F21	F21	Pause	
88	Alt_L			
89	Line Feed			
90	Return			
91	bracketright	braceright		
92	Delete			
93	F23	F23	Scroll_Lock	Break
94 <sup>1</sup>	SunF37			
95	F22	F22	Print	
96				
97				
98				

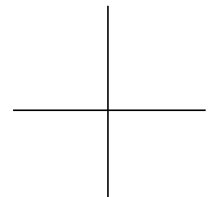


Table 17-6 N-107 Default Keymapping (Continued)

Keycode Value	Keysym	Shifted Keysym	Alt Keysym	Shifted Alt Keysym
99				
100				
101				
102	quoteright	asciitilde		
103	F24	F24	KP_Equal	
104	F18	F18	SunPaste	
105	F33	F33	KP_1	End
106				
107	Left	F30	KP_4	
108	F27	F27	KP_7	Home
109				
110				
111				
112	Insert	Insert	KP_0	
113	Delete	Delete	KP_Decimal	
114	Down	F34	KP_2	
115	F31	F31	KP_5	
116	Right	F32	KP_6	
117	Up	F28	KP_8	
118	Num_Lock			
119	F25	F25	KP_Divide	
120				
121	KP_Enter			

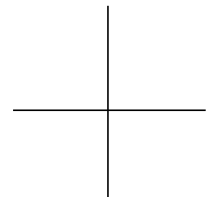
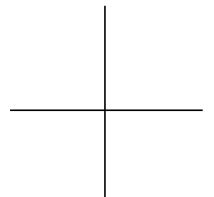


Table 17-6 N-107 Default Keymapping (Continued)

Keycode Value	Keysym	Shifted Keysym	Alt Keysym	Shifted Alt Keysym
122	F35	F35	KP_3	Next
123	Back Space			
124	KP_Add			
125	F29	F29	KP_9	Prior
126	F26	F26	KP_Multiply	
127				
128				
129	F15	F15	SunFront	
130 <sup>1</sup>	F11	F11	Cancel	
131	F13	F13	SunProp	
132	KP_Subtract			
133	F17	F17	SunOpen	
134	F19	F19	Find	
135	Help			

<sup>1</sup> OpenWindows compatibility necessitates that these keycodes do not match the key legends: F12 for keycode 8, SunF36 for keycode 86, SunF37 for keycode 94, and F11 for keycode 130.



## N-123 Sun Type 5-Compatible Keyboard Details

N-123 Sun Type 5-compatible keyboard group contains 123-key keyboards.

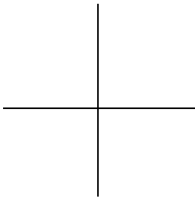
Figure 17-6 illustrates the key legends and keycodes for the N-123 US (North American) type (N-123NA).

Table 17-7 lists the keysyms for an N-123NA keyboard when used with OpenWindows.

N-123 keyboards have four LEDs. Their default values are:

- LED 1    Net on HMX series, X1 on all Explora series
- LED 2    Caps lock
- LED 3    Num lock
- LED 4    x4

To access the Boot Monitor from an N-123 keyboard after booting, use the Stop A (L1-A) key combination.



## N-123 Sun Type 5-Compatible Keyboard Details

Esc 08	F1 135	F2 15	F3 23	F4 31	F5 39	F6 47	F7 55	F8 63	F9 71	F10 79	F11 86	F12 94	
~ ' 14	! 1 22	@ 2 30	# 3 38	\$ 4 37	% 5 46	^ 6 54	& 7 61	* 8 62	( 9 70	) 0 69	- 78	+ 85	Back Space ← 102
Tab ↔ 13	Q 21	W 29	E 36	R 45	T 44	Y 53	U 60	I 67	O 68	P 77	{ 84	} 91	 \ 92
Caps Lock 20	A 28	S 27	D 35	F 43	G 52	H 51	J 59	K 66	L 75	: ; 76	" ' 82	Enter ↵ 90	
Shift ↑ 18	Z 26	X 34	C 33	V 42	B 50	N 49	M 58	< ' 65	> . 73	? / 74	Shift ↑ 89		
Control 17	Alt 25	◆ 64								◆ 72	Com- pose 57	Alt Graph 88	

Help 09		Print Screen Sys Rq 87		Scroll Lock 95		Pause Break 98						Setup 93			
Stop 10		Insert 103		Home 110		Page Up 111		Num Lock 118		/ 119		* 126		- 132	
Props 12		Del 100		End 101		Page Down 109		7 Home 108		8 ↑ 117		9 Pg Up 125		+ 124	
Front 19								4 ← 107		5 115		6 ⇒ 116			
Open 32								1 End 105		2 ↓ 114		3 Pg Dn 122		Enter 121	
Find 48								0 Ins 112				. Del 113			
Again 11															
Undo 16															
Copy 24															
Paste 40															
Cut 56															

Figure 17-6 N-123 Default Keyboard Legends and Keycodes

Table 17-7 N-123NA Keycodes and Keysyms with OpenWindows

Keycode Value	Keysym	Shifted Keysym	Alt Keysym	Shifted Alt Keysym
8	Escape			
9	Help			
10 <sup>1</sup>	F11	F11	Cancel	
11 <sup>1</sup>	F12	F12	Redo	
12	F13	F13	SunProps	
13	Tab			
14	grave	asciitilde		
15	F2			
16	F14	F14	Undo	
17	Control_L			
18	Shift_L			
19	F15	F15	SunFront	
20	Caps_Lock			
21	Q			
22	1	exclam		
23	F3			
24	F16	F16	SunCopy	
25	Alt_L			
26	Z			
27	S			
28	A			
29	W			

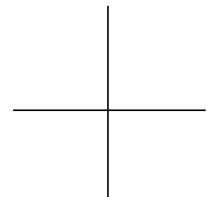


Table 17-7 N-123NA Keycodes and Keysyms with OpenWindows (Continued)

Keycode Value	Keysym	Shifted Keysym	Alt Keysym	Shifted Alt Keysym
30	2	at		
31	F4			
32	F17	F17	SunOpen	
33	C			
34	X			
35	D			
36	E			
37	4	dollar		
38	3	numbersign		
39	F5			
40	F18	F18	SunPaste	
41	space			
42	V			
43	F			
44	T			
45	R			
46	5	percent		
47	F6			
48	F19	F19	Find	
49	N			
50	B			
51	H			
52	G			

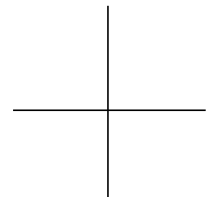


Table 17-7 N-123NA Keycodes and Keysyms with OpenWindows (Continued)

Keycode Value	Keysym	Shifted Keysym	Alt Keysym	Shifted Alt Keysym
53	Y			
54	6	asciicircum		
55	F7			
56	F20	F20	SunCut	
57	Multi_key			
58	M			
59	J			
60	U			
61	7	ampersand		
62	8	asterisk		
63	F8			
64	Meta_L			
65	comma	less		
66	K			
67	I			
68	O			
69	0	parenright		
70	9	parenleft		
71	F9			
72	Meta_R			
73	period	greater		
74	slash	question		
75	L			

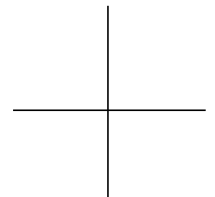




Table 17-7 N-123NA Keycodes and Keysyms with OpenWindows (Continued)

Keycode Value	Keysym	Shifted Keysym	Alt Keysym	Shifted Alt Keysym
76	semicolon	colon		
77	P			
78	minus	underscore		
79	F10			
80	no assigned keysym			
81	no assigned keysym			
82	apostrophe	quotedbl		
83	no assigned keysym			
84	bracketleft	braceleft		
85	equal	plus		
86 <sup>1</sup>	SunF36			
87	F22	F22	Print	SunSys_Req
88	Mode_switch			
89	Shift_R			
90	Return			
91	bracketright	braceright		
92	backslash	bar	brokenbar	
93	WYSetup <sup>3</sup>			
94 <sup>1</sup>	SunF37			
95	F23	F23	Scroll_Lock	
96	Down			

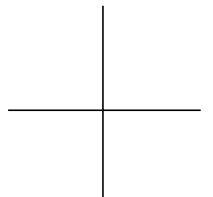


Table 17-7 N-123NA Keycodes and Keysyms with OpenWindows (Continued)

Keycode Value	Keysym	Shifted Keysym	Alt Keysym	Shifted Alt Keysym
97	Left			
98	F21	F21	Pause	Break
99	Up			
100	Delete			
101	End			
102	Backspace			
103	Insert			
104				
105	F33	F33	KP_1	End
106	Right			
107	Left	F30	KP_4	
108	F27	F27	KP_7	Home
109	Next			
110	Home			
111	Prior			
112	Insert	Insert	KP_0	
113	Delete	Delete	KP_Decimal	
114	Down	F34	KP_2	
115	F31	F31	KP_5	
116	Right	F32	KP_6	
117	Up	F28	KP_8	
118	Num_Lock			
119	F25	F25	KP_Divide	

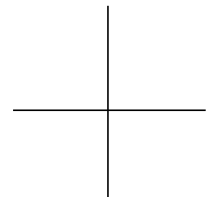


Table 17-7 N-123NA Keycodes and Keysyms with OpenWindows (Continued)

Keycode Value	Keysym	Shifted Keysym	Alt Keysym	Shifted Alt Keysym
120 <sup>2</sup>				
121	KP_Enter			
122	F35	F35	KP_3	Next
123				
124	KP_Add			
125	F29	F29	KP_9	Prior
126	F26	F26	KP_Multiply	
127	no assigned keysyms			
128	no assigned keysyms			
129	no assigned keysyms			
130	no assigned keysyms			
131	no assigned keysyms			
132	F24	F24	KP_Subtract	
133				
134				
135	F1			

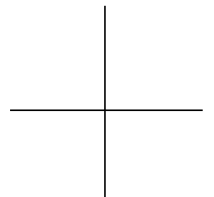


Table 17-7 N-123NA Keycodes and Keysyms with OpenWindows (Continued)

Keycode Value	Keysym	Shifted Keysym	Alt Keysym	Shifted Alt Keysym
Keycodes 218 through 248 are used only for compose sequences that create European characters not available on North American keyboards.				
218	agrave	Agrave		
219	egrave	Egrave		
220	igrave	Igrave		
221	ograve	Ograve		
222	ugrave	Ugrave		
223	grave			
224	acircumflex	Acircumflex		
225	ecircumflex	Ecircumflex		
226	icircumflex	Icircumflex		
227	ocircumflex	Ocircumflex		
228	ucircumflex	Ucircumflex		
229	asciicircum			
230	adiaeresis	Adiaeresis		
231	ediaeresis	Ediaeresis		
232	idiaeresis	Idiaeresis		
233	odiaeresis	Odiaeresis		
234	udiaeresis	Udiaeresis		
235	ydiaeresis			
236	diaeresis	diaeresis		
237	atilde	Atilde		
238	ntilde	ntilde		

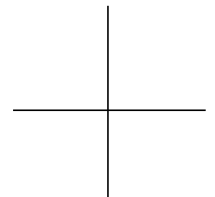


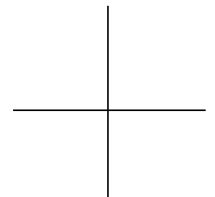
Table 17-7 N-123NA Keycodes and Keysyms with OpenWindows (Continued)

Keycode Value	Keysym	Shifted Keysym	Alt Keysym	Shifted Alt Keysym
239	otilde	Otilde		
240	asciitilde			
241	aacute	Aacute		
242	eacute	Eacute		
243	iacute	Iacute		
244	oacute	Oacute		
245	uacute	Uacute		
246	acute			
247	ccedilla	Ccedilla		
248	cedilla			

<sup>1</sup> OpenWindows compatibility necessitates that these keycodes do not match the key legends: Stop for keycode 10, Again for keycode 11, SunF36 for keycode 86, and SunF37 for keycode 94.

<sup>2</sup> Keycode 120 is available only on European language keyboards.

<sup>3</sup> WYSetup is an NCD-specific keysym mapped to the NCD Setup keysym.



## Using Downloadable Keyboard Description Files

NCDware provides a mechanism for experienced system administrators to configure terminals to work with keyboards that are not explicitly supported in the NCD X server, such as some international keyboards.

This appendix describes how to use a keyboard description file downloaded from the host during terminal booting to support such keyboard usage. Keyboard description files may be available from the NCD FTP site or from other vendors.

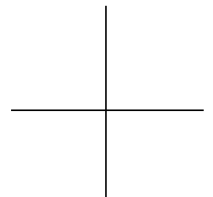
To use an unsupported keyboard, you need to:

1. Find or prepare a keyboard description file describing the behavior of the keyboard. See the content and format descriptions later in this appendix. Make sure that the file is world-readable.
2. Make sure that the directory containing the keyboard description file is accessible through the **file-service-table** parameter (Setup ⇒ Change Setup Parameters ⇒ File Service ⇒ File Service Table). For information about this parameter, see Chapter 5, Configuring Network Services.
3. Configure the terminal to read the keyboard description file during booting. In a remote configuration file, set the **xserver-keyboard-description-file** parameter to the name of the keyboard definition file (Setup ⇒ Change Setup Parameters ⇒ Input Devices ⇒ Keyboard Description File).
4. Plug in the keyboard.
5. Reboot the terminal. The first time you boot the terminal after using a new keyboard description file, check the `Messages` hide box in the Console to make sure that the file was read without error.

## Creating a Keyboard Definition File

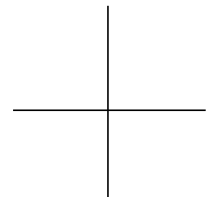
This section describes how to manually create or edit a keyboard description file.

**Note** You can also create a keyboard description file for the keyboard attached to the terminal from Change Setup Parameters. In the Input hide box, click on `Write Keyboard Description File`. In the dialog box that appears, type the pathname of the file and click on `OK`.



A keyboard description file is an ASCII file containing statements defining keyboard behavior. The statements describe the following keyboard characteristics:

Scancode table	Used by the keyboard driver to map hardware scancodes of range [0..255] into X keycodes of range [8..254]. Also used to make one keyboard imitate another.
Keycode table	Used by applications to convert X keycodes into keysyms. Also used by the X server when internal dead-key processing is enabled. Keycodes are the codes assigned to the physical keys. Keysyms are the actions taken when keys are pressed. Dead-keys are keys pressed before other key presses (such as an accent and a vowel) to produce an accented vowel letter, as required in many European languages.
Dead-key sequences	Sequences of keys intercepted by the keyboard driver and replaced by another key.
Modifiers table	Keys that are treated as modifiers, such as Shift, Lock, Control, Mod1-5. Typical values are: Shift      Shift_L      Shift_R Lock      Caps_Lock Control    Control_L      Control_R  The following values vary depending on the keyboard: Mod1    Alt_L      Alt_R    Meta_L    Meta_R Mod4    Num_Lock Mod5    Mode_switch
Clicking list	Keys that click through the base speaker when pressed.
Locking list	Keys that lock when pressed, requiring a second press to release, usually used with modifier keys. By default, all keysyms containing the name “lock” are locking keys.



Latching list	Keys that are treated as locking until the next key is released, usually used with modifier keys. By default, the Mode_switch keysym latches.
Repeating list	Keys that autorepeat.
LED actions table	Maps LED number to the state that causes that LED to light.

The format of a keyboard definition file is similar to an **xmodmap** file:

- ❑ Each line consists of a keyword and values.
- ❑ Blank lines are ignored. Use an exclamation point anywhere on a line to cause the remainder of the line to be ignored.
- ❑ Use a backslash (\) at the end of the line to continue a statement past the end of a line. The backslash, following carriage return, newline, and any leading white space are replaced with a single space.

Table 17-8 summarizes the statements permitted in a keyboard definition file. A statement consists of one or more keywords and values. The values permitted in the statements are defined in Table 17-9.

Table 17-8 Keyboard Description File Statements

Statement (Keyword/Value)	Description
name <i>QUOTEDSTRING</i>	Specifies the name of the keyboard; typically, the first line in the file.
include <i>QUOTEDSTRING</i>	Reads in other files needed to assemble a keyboard description from other files such as <b>deadkeys.kbd</b> or a personal keyboard file such as <b>my.kbd</b> .
initialize	Sets keyboard state tables to known values: <ul style="list-style-type: none"><li>❑ All keys repeat and click</li><li>❑ No keys lock or latch</li><li>❑ Dead-key, setup, debug, keysym, and modifier tables are cleared</li><li>❑ The scancodes map one-to-one with keycodes</li></ul>

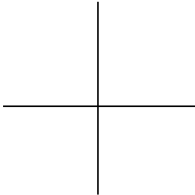




Table 17-8 Keyboard Description File Statements (Continued)

Statement (Keyword/Value)	Description
<p>scancode <b>SCANCODE = KEYCODE</b></p> <p>scancode <b>LISTofSCANCODE = LISTofKEYCODE</b></p>	<p>Sets values in the scancode-to-keycode table used by the keyboard driver. By default, scancodes are used as keycode values. Individual scancodes can be replaced by individual values. Destination keycodes must be in the range 8 to 254 for X operations.</p> <p><b>LISTofSCANCODE</b> and <b>LISTofKEYCODE</b> must be separated by blanks and must be equal in length and represent a one-to-one correspondence of scancode to keycode. Scancodes are in a range of 0 to 255.</p>
keycode <b>KEYCODE = LISTofKEYSYM</b>	Sets a row in the keycode-to-keysym table that X applications use to convert keycodes into keysyms. The list of keysyms can contain 0, 1, 2, 3, or 4 keysyms. Keycodes must be in a range of 8 to 254.
keysym <b>KEYSYM = LISTofKEYSYM</b>	Changes an existing keyboard configuration by replacing a keysym that is currently bound to a keycode with one or more new keysyms. It is usually placed at the end of the keyboard definition file.
deadkey <b>KEYSYM LISTofKEYSYM = KEYSYM</b>	Specifies a sequence of keys to press to generate another key when local dead-key processing is enabled. For more information about this statement, see “Specifying Dead-Key Processing” on page 17-60.
<p>modifier <b>MODIFIER = LISTofKEYSYM</b></p> <p>modifier add <b>MODIFIER = LISTofKEYSYM</b></p>	Specifies the list of keys associated with an X modifier. All of the keycodes containing any of the keysyms are set, added to, or removed from the indicated modifier list. The modifier list is actually constructed at the end of all keyboard file processing so that it can use the final keysym table values.
modifier remove <b>MODIFIER = LISTofKEYSYM</b>	Removes a key from the modifier list.
modifier clear <b>MODIFIER</b>	Clears the existing list.
click = <b>LISTofKEYSYM</b>	Specifies keys that should click when pressed and clears any already existing list of clickable keys.

Table 17-8 Keyboard Description File Statements (Continued)

Statement (Keyword/Value)	Description
click add = <b><i>LISTofKEYSYM</i></b>	Specifies additional keys that should click without clearing the click list.
click remove = <b><i>LISTofKEYSYM</i></b>	Removes a key from the click list.
click clear	Clears the existing list.
lock = <b><i>LISTofKEYSYM</i></b>	Specifies keysyms that should ignore release events, requiring a second press for release. By default, all keys with keysyms with the word “lock” are locking.
lock add = <b><i>LISTofKEYSYM</i></b>	Specifies additional keys that should lock without clearing the lock list.
lock remove = <b><i>LISTofKEYSYM</i></b>	Removes a key from the lock list.
latch = <b><i>LISTofKEYSYM</i></b>	Specifies keysyms that are treated as latching, with a release that is delayed until the next key is released. By default, the Mode_switch key is latched.
latch add = <b><i>LISTofKEYSYM</i></b>	Specifies additional keys that should latch without clearing the latch list.
latch remove = <b><i>LISTofKEYSYM</i></b>	Removes a key from the latch list.
repeat = <b><i>LISTofKEYSYM</i></b>	Specifies keys that should repeat automatically when pressed.
repeat add = <b><i>LISTofKEYSYM</i></b>	Specifies additional keys that should repeat without clearing the repeat list.
repeat remove = <b><i>LISTofKEYSYM</i></b>	Removes a key from the repeat list.
led <b>NUMBER</b> = <b><i>LED ACTION</i></b>	Specifies when keyboard LEDs should light up. <b>NUMBER</b> is the LED number (1, 2, 3, or 4) and <b>LED ACTION</b> is one of the following: "x1"                    "x2"                    "x3"                    "x4" "control"            "num"                    "warn"                    "net" "shift"                "caps"                    "mod1"                    "mod2" "mod3"                "mod4"                    "mod5"

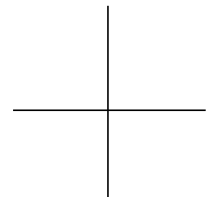


Table 17-8 Keyboard Description File Statements (Continued)

Statement (Keyword/Value)	Description
led map <i>NUMBER</i> = <i>NUMBER</i>	Changes the mapping of the LEDs for keyboards in which the LEDs are not in sequential number.
led invert <i>NUMBER</i>	Reverses the sense of the LED for keyboards with inverted LED sense.
led total <i>NUMBER</i>	Sets the maximum number of LEDs that the keyboard supports.
led enable	Enables the led commands if they have been disabled.
led disable	Disables led commands to the keyboard.
setup = <i>Setup key</i> + <i>modifiers</i>	Displays the NCDware Console. To disable this command, do not define a Setup key and modifiers ( <b>setup</b> = ).
debug = <i>Debug key</i> + <i>modifiers</i>	Aborts the X server, placing the terminal in the control of the Boot Monitor. To disable this command, do not define a debug key and modifiers ( <b>debug</b> = ).

Table 17-9 Permitted Values in Keyboard Description Files

Value	Syntax
<i>QUOTEDSTRING</i>	An ASCII string of characters within quotes (“ ”)
<i>NUMBER</i>	A positive integer
<i>SCANCODE</i>	<i>NUMBER</i>
<i>KEYCODE</i>	<i>NUMBER</i>
<i>KEYSYM</i>	A string representing an X keysym name

Table 17-9 Permitted Values in Keyboard Description Files (Continued)

Value	Syntax
<i>LISTofKEYSYM</i>	Any of the following: <i>KEYSYM</i> <i>KEYSYM, LISTofKEYSYM</i> <i>KEYSYM LISTofKEYSYM</i> <i>LISTofKEYSYM</i> can also be an empty list.
<i>MODIFIER</i>	Any of the following: “shift”            “mod2” “control”        “mod3” “lock”            “mod4” “mod1”           “mod5”

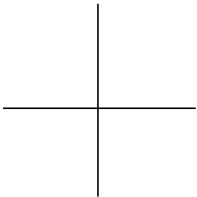
Specifying Dead-Key Processing

The following keyboard description file statement specifies a sequence of keys to press to generate another key when local dead-key processing is enabled:

```
deadkey KEYSYM LISTofKEYSYM = KEYSYM
```

The range of *LISTofKEYSYM* is 1, 2. The resulting keySYM must have been defined before this command so that the resulting table can be correctly populated.

In this mode, the keyboard driver looks at each key press as it is entered, intercepting keySyms for sequences of keys that match those specified in the dead-key statement. The first keySYM on the left of the equals sign (=) is usually either the keySYM Multi\_key (for Digital-style triple-key compose sequences) or one of the dead-accent keySyms listed in Table 17-10.



**Table 17-10 Dead-Key Accent Keysyms**

Old Digital Versions:	New X11R6 Standard Versions:	
Dring_acent	dead_abovering	dead_macron
Dcircumflex_accent	dead_circumflex	dead_breve
Dcedilla_accent	dead_cedilla	dead_abovedot
Dacute_accent	dead_acute	dead_doubleacute
Dgrave_accent	dead_grave	dead_caron
Dtilde	dead_tilde	dead_ogonek
Ddieresis	dead_dieresis	dead_iota
	dead_voiced_sound	
	dead_semivoiced_sound	

The keysyms for accented vowels produced using dead-keys differ from those used when the accent is a standalone character (degree, asciicircum, cedilla, acute, grave, asciitilde, and dieresis).

When you type a dead keysym, the keyboard driver delays processing of the keyboard events until it either completes a dead-key sequence or encounters a non-modifier keysym that does not match a sequence containing the keys typed so far. If no match is found, the bell rings and the delayed keyboard events are processed separately. Otherwise, if a full sequence is recognized, the keyboard driver replaces the recognized sequence with events that generate the keysym specified on the right (except when the keysym isn't on the keyboard).

The Shift, Lock, and Mode\_switch bits in the modifier mask of the replacement event are synthesized as necessary to obtain the desired keysym; all other bits in the modifier mask are the same as in the final event in the recognized sequence.

When conflicts arise over whether the keyboard driver should complete one sequence or continue to process for a longer superset, the driver completes the shorter set.

