

VT102 PROGRAMMING REFERENCE CARD

CONTROL CHARACTERS RECEIVED

Name	Character Mnemonic	Octal Code	Function
Null	NUL	000	This character is ignored when received (not stored in input buffer) and used as a fill character.
End Of Text	ETX	003	This character can be selected as a half-duplex turnaround character.
End Of Transmission	EOT	004	This character can be selected as a disconnect character or as a half-duplex turnaround character. When used as a turnaround character, the disconnect character is DLE-EOT.
Enquire	ENQ	005	This character transmits the answerback message.
Bell	BEL	007	This character generates a bell tone.
Backspace	BS	010	This character moves the cursor to the left one character position, unless it is at the left margin, in which case no action occurs.
Horizontal Tab	HT	011	This character moves the cursor to the next tab stop, or to the right margin if there are no more tab stops.

Name	Character Mnemonic	Octal Code	Function	Name	Character Mnemonic	Octal Code	Function
Line Feed	LF	012	This character causes a line feed or a new line operation. (refer to Linefeed/New Line mode.)	Cancel	CAN	030	If received during an escape or control sequence, the sequence is cancelled and substitution character (§) is displayed.
Vertical Tab	VT	013	This character is processed as LF.	Substitute	SUB	032	This character is processed as CAN.
Form Feed	FF	014	This character is processed as LF. It can also be selected as a half-duplex turnaround character.	Escape	ESC	033	This character is processed as a sequence introducer.
Carriage Return	CR	015	This character moves the cursor to left margin on the current line. It can also be selected as a half-duplex turnaround character.	Delete	DEL	177	This character is ignored when received (not stored in input buffer).
ANSI COMPATIBLE SEQUENCES							
Set Mode							
Shift Out	SO	016	This character selects the G1 character set, as designated by a Select Character Set sequence.	Keyboard action	KAM	Locked	ESC [2 h
Shift In	SI	017	This character selects the G0 character set, as designated by a Select Character Set sequence.	Insertion-replacement	IRM	Insert	ESC [4 h
Device Control 1	DC1	021	This character is processed as XON. It causes the terminal to continue transmitting characters.	Send-receive	SRM	Off	ESC [1 2 h
Device Control 3	DC3	023	This character is processed as XOFF. It causes terminal to stop transmitting all characters except XOFF and XON. It can also be selected as a half-duplex turnaround character.	Line feed/new line	LMN	New line	ESC [2 0 h
				Cursor key	DECCKM	Application	ESC [? 1 h
				ANSI/VT52	DECANM	ANSI	N/A
				Column	DECCOLM	132 column	ESC [? 3 h
				Scrolling	DECSCLM	Smooth	ESC [? 4 h
				Screen	DECSCNM	Reverse	ESC [? 5 h
				Origin	DECOM	Relative	ESC [? 6 h
				Auto wrap	DECAWM	On	ESC [? 7 h
				Auto repeat	DECARM	On	ESC [? 8 h
				Print form feed	DECPFF	On	ESC [? 1 8 h
				Print extent	DECPEX	Full Screen	ESC [? 1 9 h

Reset Mode

Name	Mnemonic	Mode	Sequence
Keyboard action	KAM	Unlocked	ESC [2 l*
Insertion-replacement	IRM	Replace	ESC [4 l*
Send-receive	SRM	On	ESC [1 2 l*
Line feed/new line	LMN	Line feed	ESC [2 0 l*
Cursor key	DECCKM	Cursor	ESC [? 1 l*
ANSI/VT52	DECANM	VT52	ESC [? 2 l*
Column	DECCOLM	80 column	ESC [? 3 l*
Scrolling	DECSCLM	Jump	ESC [? 4 l*
Screen	DECSCNM	Normal	ESC [? 5 l*
Origin	DECOM	Absolute	ESC [? 6 l*
Auto wrap	DECAWM	Off	ESC [? 7 l*
Auto repeat	DECARM	Off	ESC [? 8 l*
Print form feed	DECFF	Off	ESC [? 1 8 l*
Print extent	DECPEX	Scrolling Region	ESC [? 1 9 l*

* The last character of the sequence is lowercase L (154₈)

Cursor Key Codes Generated

ANSI Characters Generated		
Cursor Key (Arrow)	Reset (Cursor)	Set (Application)
Up	ESC [A	ESC O A
Down	ESC [B	ESC O B
Right	ESC [C	ESC O C
Left	ESC [D	ESC O D

Keypad Character Selection

Name	Mnemonic	Sequence
Alternate Numeric	DECKPAM	ESC =
Numeric	DECKPNM	ESC >

Keypad Codes Generated

	VT52 Key	VT52 Numeric Keypad Mode	ANSI Numeric Keypad Mode	ANSI Alternate Keypad Mode
0	0	ESC ? p	0	ESC O p
1	1	ESC ? q	1	ESC O q
2	2	ESC ? r	2	ESC O r
3	3	ESC ? s	3	ESC O s
4	4	ESC ? t	4	ESC O t
5	5	ESC ? u	5	ESC O u
6	6	ESC ? v	6	ESC O v
7	7	ESC ? w	7	ESC O w
8	8	ESC ? x	8	ESC O x
9	9	ESC ? y	9	ESC O y
- (minus)	- (minus)	ESC ? m	- (minus)	ESC O m
, (comma)	, (comma)	ESC ? l*	, (comma)	ESC O l*
. (period)	. (period)	ESC ? n	. (period)	ESC O n
ENTER	Same as RETURN	ESC ? M	Same as RETURN	ESC O M
PF1	ESC P	ESC P	ESC O P	ESC O P
PF2	ESC Q	ESC Q	ESC O Q	ESC O Q
PF3	ESC R	ESC R	ESC O R	ESC O R
PF4	ESC S	ESC S	ESC O S	ESC O S

* The last character of the sequence is lowercase L (154₈)

Select Character Sets SCS

Character Set	G0 Designator	G1 Designator
United Kingdom (UK)	ESC (A	ESC) A
United States (USASCII)	ESC (B	ESC) B
Special characters and line drawing set	ESC (0	ESC) 0
Alternate character ROM	ESC (1	ESC) 1
Alternate character ROM -	ESC (2	ESC) 2
Special characters		

Name	Mnemonic	Sequence
Single Shift 2		SS2
Single Shift 3		SS3

US/UK Character Set

		BITS		0 0		0 1		0 2		0 3		0 4		0 5		0 6		0 7	
		COL/ROW		0		1		2		3		4		5		6		7	
0 0 0 0 0	c	NUL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
0 0 0 0 1	x	SP	43	0	40	40	40	40	40	40	40	40	40	40	40	40	40	40	
0 0 0 1 0	z	DC1	21	!	41	1	51	A	121	Q	81	a	141	q	161	181	191	191	
0 0 0 1 1	y	DC2	20	?	42	2	52	B	122	R	82	b	142	r	162	182	192	192	
0 0 1 0 0	3	DC3	22	*	43	3	53	C	123	S	83	c	143	s	163	183	193	193	
0 0 1 0 1	4	ENQ	24	#	44	4	54	D	124	T	84	d	144	t	164	184	194	194	
0 0 1 0 2	5	BS	25	%	45	5	55	E	125	U	85	e	145	u	165	185	195	195	
0 0 1 0 3	6	CAN	26	&	46	6	56	F	126	V	86	f	146	v	166	186	196	196	
0 0 1 0 4	7	BEL	27	'	47	7	57	G	127	W	87	g	147	w	167	187	197	197	
0 0 1 0 5	8	HT	28	(`)	48	8	58	H	128	X	88	h	148	x	168	188	198	198	
0 0 1 0 6	9	LF	29)	49	9	59	I	129	Y	89	i	149	y	169	189	199	199	
0 0 1 0 7	10	SUB	30	*	50	:	52	J	130	Z	90	j	152	z	172	192	192	192	
0 0 1 0 8	11	VT	31	+	51	:	53	K	131	E	91	k	153	{	173	193	193	193	
0 0 1 0 9	12	ESC	32	<	52	:	54	L	132	\	92	l	154		174	194	194	194	
0 0 1 0 10	13	FF	33	=	53	:	55	M	133	m	93	m	155	}	175	195	195	195	
0 0 1 0 11	14	SO	34	>	54	:	56	N	134	A	94	n	156	~	176	196	196	196	
0 0 1 0 12	15	SI	35	?	55	:	57	O	135	R	95	o	157	DEL	177	197	197	197	
0 0 1 0 13	16	CR	36	/	56	:	58	P	136	S	96	p	158		178	198	198	198	
0 0 1 0 14	17	SO	37	^	57	:	59	Q	137	T	97	q	159		179	199	199	199	
0 0 1 0 15	18	SI	38	?	58	:	60	R	138	U	98	r	160		180	200	200	200	
0 0 1 0 16	19	SI	39	/	59	:	61	S	139	V	99	s	161		181	201	201	201	
0 0 1 0 17	20	SI	40	^	60	:	62	T	140	W	100	t	162		182	202	202	202	
0 0 1 0 18	21	SI	41	~	61	:	63	U	141	X	101	u	163		183	203	203	203	
0 0 1 0 19	22	SI	42		62	:	64	V	142	Y	102	v	164		184	204	204	204	
0 0 1 0 20	23	SI	43		63	:	65	W	143	Z	103	w	165		185	205	205	205	
0 0 1 0 21	24	SI	44		64	:	66	X	144	A	104	x	166		186	206	206	206	
0 0 1 0 22	25	SI	45		65	:	67	Y	145	B	105	y	167		187	207	207	207	
0 0 1 0 23	26	SI	46		66	:	68	Z	146	C	106	z	168		188	208	208	208	
0 0 1 0 24	27	SI	47		67	:	69	W	147	D	107	w	169		189	209	209	209	
0 0 1 0 25	28	SI	48		68	:	70	V	148	E	108	v	170		190	210	210	210	
0 0 1 0 26	29	SI	49		69	:	71	U	149	F	109	u	171		191	211	211	211	
0 0 1 0 27	30	SI	50		70	:	72	T	150	G	110	t	172		192	212	212	212	
0 0 1 0 28	31	SI	51		71	:	73	S	151	H	111	s	173		193	213	213	213	
0 0 1 0 29	32	SI	52		72	:	74	R	152	I	112	r	174		194	214	214	214	
0 0 1 0 30	33	SI	53		73	:	75	Q	153	J	113	q	175		195	215	215	215	
0 0 1 0 31	34	SI	54		74	:	76	P	154	K	114	p	176		196	216	216	216	
0 0 1 0 32	35	SI	55		75	:	77	O	155	L	115	o	177		197	217	217	217	
0 0 1 0 33	36	SI	56		76	:	78	N	156	M	116	n	178		198	218	218	218	
0 0 1 0 34	37	SI	57		77	:	79	M	157	K	117	m	179		199	219	219	219	
0 0 1 0 35	38	SI	58		78	:	80	J	158	I	118	j	180		200	220	220	220	
0 0 1 0 36	39	SI	59		79	:	81	I	159	H	119	i	181		201	221	221	221	
0 0 1 0 37	40	SI	60		80	:	82	H	160	G	120	h	182		202	222	222	222	
0 0 1 0 38	41	SI	61		81	:	83	G	161	F	121	g	183		203	223	223	223	
0 0 1 0 39	42	SI	62		82	:	84	F	162	E	122	f	184		204	224	224	224	
0 0 1 0 40	43	SI	63		83	:	85	E	163	D	123	e	185		205	225	225	225	
0 0 1 0 41	44	SI	64		84	:	86	D	164	C	124	d	186		206	226	226	226	
0 0 1 0 42	45	SI	65		85	:	87	C	165	B	125	c	187		207	227	227	227	
0 0 1 0 43	46	SI	66		86	:	88	B	166	A	126	b	188		208	228	228	228	
0 0 1 0 44	47	SI	67		87	:	89	A	167	SP	127	a	189		209	229	229	229	
0 0 1 0 45	48	SI	68		88	:	90	SP	168	0	128	sp	190		210	230	230	230	
0 0 1 0 46	49	SI	69		89	:	91	0	169	SP	129	0	191		211	231	231	231	
0 0 1 0 47	50	SI	70		90	:	92	SP	170	0	130	sp	192		212	232	232	232	
0 0 1 0 48	51	SI	71		91	:	93	0	171	SP	131	0	193		213	233	233	233	
0 0 1 0 49	52	SI	72		92	:	94	SP	172	0	132	sp	194		214	234	234	234	
0 0 1 0 50	53	SI	73		93	:	95	SP	173	0	133	sp	195		215	235	235	235	
0 0 1 0 51	54	SI	74		94	:	96	SP	174	0	134	sp	196		216	236	236	236	
0 0 1 0 52	55	SI	75		95	:	97	SP	175	0	135	sp	197		217	237	237	237	
0 0 1 0 53	56	SI	76		96	:	98	SP	176	0	136	sp	198		218	238	238	238	
0 0 1 0 54	57	SI	77		97	:	99	SP	177	0	137	sp	199		219	239	239	239	
0 0 1 0 55	58	SI	78		98	:	100	SP	178	0	138	sp	200		220	240	240	240	
0 0 1 0 56	59	SI	79		99	:	101	SP	179	0	139	sp	201		221	241	241	241	
0 0 1 0 57	60	SI	80		100	:	102	SP	180	0	140	sp	202		222	242	242	242	
0 0 1 0 58	61	SI	81		101	:	103	SP	181	0	141	sp	203		223	243	243	243	
0 0 1 0 59	62	SI	82		102	:	104	SP	182	0	142	sp	204		224	244	244	244	
0 0 1 0 60	63	SI	83		103	:	105	SP	183	0	143	sp	205		225	245	245	245	
0 0 1 0 61	64	SI	84		104	:	106	SP	184	0	144	sp	206		226	246	246	246	
0 0 1 0 62	65	SI	85		105	:	107	SP	185	0	145	sp	207		227	247	247	247	
0 0 1 0 63	66	SI	86		106	:	108	SP	186	0	146	sp	208		228	248	248	248	
0 0 1 0 64	67	SI	87		107	:	109	SP	187	0	147	sp	209		229	249	249	249	
0 0 1 0 65	68	SI	88		108	:	110	SP	188	0	148	sp	210		230	250	250	250	
0 0 1 0 66	69	SI	89		109	:	111	SP	189	0	149	sp	211		231	251	251	251	
0 0 1 0 67	70	SI	90		110	:	112	SP	190	0	150	sp	212		232	252	252	252	
0 0 1 0 68	71	SI	91		111	:	113	SP	191	0	151	sp	213		233	253	253	253	
0 0 1 0 69	72	SI	92		112	:	114	SP	192	0	152	sp	214		234	254	254	254	
0 0 1 0 70	73	SI	93		113	:	115	SP	193	0	153	sp	215		235	255	255	255	
0 0 1 0 71	74	SI	94		114	:	116	SP	194	0	154	sp	216		236	256	256	256	
0 0 1 0 72	75	SI	95		115	:	117	SP	195	0	155	sp	217		237	257	257	257	
0 0 1 0 73	76	SI	96		116	:	118	SP	196	0	156	sp	218		238	258	258	258	
0 0 1 0 74	77	SI	97		117	:	119	SP	197	0	157	sp	219		239	259	259	259	
0 0 1 0 75	78	SI	98		118	:	120	SP	198	0	158	sp	220		240	260	260	260	
0 0 1 0 76	79	SI	99		119	:	121	SP	199	0	159	sp	221		241	261	261	261	
0 0 1 0 77	80	SI	100		120	:	122	SP	200	0	160	sp	222		242	262	262	262	
0 0 1 0 78</																			

Character Attributes

Name	Mnemonic	Sequence
Select Graphic Rendition (no attributes)	SGR	ESC [m
Select Graphic Rendition (no attributes)	SGR	ESC [0 m
Select Graphic Rendition (select attribute bold)	SGR	ESC [1 m
Select Graphic Rendition (select attribute underline)	SGR	ESC [4 m
Select Graphic Rendition (select attribute blink)	SCR	ESC [5 m
Select Graphic Rendition (select attribute, reverse video)	SGR	ESC [7 m

Scrolling Region

Name	Mnemonic	Sequence
Set top and bottom margins	DECSTBM	ESC [Pt; Pb r

Cursor Movement Commands

Name	Mnemonic	Sequence
Cursor up	CUU	ESC [Pn A
Cursor down	CUD	ESC [Pn B
Cursor forward (right)	CUF	ESC [Pn C
Cursor backward (left)	CUB	ESC [Pn D
Cursor position	CUP	ESC [Pl; Pc H
Cursor position (home)	CUP	ESC [H
Horizontal and vertical position	HVP	ESC [Pt; Pc f
Horizontal and vertical position (home)	HVP	ESC [f
Index	IND	ESC D
Reverse index	RI	ESC M
Next line	NEL	ESC E
Save cursor (and attributes)	DECSC	ESC 7
Restore cursor (and attributes)	DECRC	ESC 8

Tab Stops

Name	Mnemonic	Sequence
Horizontal tab set (at current column)	HTS	ESC H
Tabulation clear (at current column)	TBC	ESC [g
Tabulation clear (at current column)	TBC	ESC [0 g
Tabulation clear (all tabs)	TBC	ESC [3 g

Line Attributes

Name	Mnemonic	Sequence
Double-height top half	DEC DHL	ESC # 3
Double-height bottom half	DEC DHL	ESC # 4
Single-width single-height	DEC SWL	ESC # 5
Double-width single-height	DEC DWL	ESC # 6

Erasing

Name	Mnemonic	Sequence
Erase in line (cursor to end of line)	EL	ESC [K
Erase in line (cursor to end of line)	EL	ESC [0 K
Erase in line (beginning of line to cursor)	EL	ESC [1 K
Erase in line (entire line containing cursor)	EL	ESC [2 K
Erase in display (cursor to end of screen)	ED	ESC [J
Erase in display (cursor to end of screen)	ED	ESC [0 J
Erase in display (beginning of screen to cursor)	ED	ESC [1 J
Erase in display (entire screen)	ED	ESC [2 J

Editing Functions

Name	Mnemonic	Sequence
Delete character	DCH	ESC [Pn P
Insert line	IL	ESC [Pn L
Delete line	DL	ESC [Pn M

Print Commands

Name	Mnemonic	Sequence
Media copy (enter auto print)	MC	ESC [? 5 i
Media copy (exit auto print)	MC	ESC [? 4 i
Media copy (enter printer controller)	MC	ESC [5 i
Media copy (exit printer controller)	MC	ESC [4 i
Media copy (print screen)	MC	ESC [i
Media copy (print screen)	MC	ESC [0 i
Media copy (print cursor line)	MC	ESC [? 1 i

Reports

Name	Mnemonic	Sequence
Device status report (request status of VT102)	DSR	ESC [5 n

Response:

Terminal OK	DSR	ESC [0 n
Terminal not OK	DSR	ESC [3 n

Device status report (request status of printer)	DSR	ESC [? 15 n
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Response:	DSR	ESC [? 10 n
Printer ready	DSR	ESC [? 11 n
Printer not ready	DSR	ESC [? 12 n

No printer	DSR	ESC [? 13 n
Device status report (report cursor position)	DSR	ESC [6 n
Cursor position report	CPR	ESC [P1; Pc R

Device attributes (what are you)	DA	ESC [c
Device attributes (what are you)	DA	ESC [0 c
Identify Terminal (what are you)	DECID	ESC Z

NOTE: ESC Z is not recommended.

Device Attributes Response: VT102	DA	ESC [? 6 c
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Reset

Name	Mnemonic	Sequence
Reset to initial state	RIS	ESC c

Tests and Adjustments

Name	Mnemonic	Sequence
Screen alignment display (fill screen with "Es")	DECALN	ESC # 8
Invoke confidence test (power-up test)	DECTST	ESC [2 : 1 y
Invoke confidence test (data loop back test, requires test connector)	DECTST	ESC [2 : 2 y
Invoke confidence test (EIA modem control test, requires test connector)	DECTST	ESC [2 : 4 y
Invoke confidence test (repeat power-up test continuously until failure or power-off)	DECTST	ESC [2 : 9 y
Invoke confidence test (repeat data loopback test continuously until failure or power-off, requires test connector)	DECTST	ESC [2 : 10 y
Invoke confidence test (repeat EIA test continuously until failure or power-off, requires test connector)	DECTST	ESC [2 : 12 y
Invoke confidence test printer port data loopback test, requires test connector	DECTST	ESC [2 : 16 y
Invoke confidence test (repeat printer port data loopback test continuously until failure or power-off, requires test connector)	DECTST	ESC [2 : 24 y

Keyboard LEDs

Name	Mnemonic	Sequence
Load LEDs (L1 off)	DECLL	ESC q
Load LEDs (L1 off)	DECLL	ESC 0 q
Load LEDs (L1 on)	DECLL	ESC 1 q

VT52 COMPATIBLE MODE

Modes	Sequence
Enter ANSI mode	ESC <
Keypad Character Selection	ESC =
Name	Sequence
Enter alternate keypad mode	ESC =
Exit alternate keypad mode	ESC >
(Numeric keypad mode)	
<i>NOTE: VT52 alternate keypad and numeric keypad mode different than ANSI.</i>	
Character Sets	
Name	Sequence
Special graphics character set	ESC F*
Select US/UK character set	ESC G
(as determined by the US/UK character SET-UP feature)	
Cursor Position	
Name	Sequence
Cursor up†	ESC A
Cursor down†	ESC B
Cursor right†	ESC C
Cursor left†	ESC D
Cursor to home	ESC H
Direct cursor address	ESC Y PI Pc‡
Reverse line feed	ESC I §

* Same as special character and line drawing set in ANSI mode.
 † Same when sent from the terminal.
 ‡ Line and column numbers for direct cursor address are single character codes whose values are the desired number plus (37)₁₀. Line and column numbers start at one.
 § The last character of the sequence is an uppercase i (111)₁₀.

Erasing

Name	Sequence
Erase to end of line	ESC K
Erase to end of screen	ESC J

Print Commands

Name	Sequence
Enter auto print mode	ESC ^
Exit auto print mode	ESC -
Enter printer controller mode	ESC W
Exit printer controller mode	ESC X
Print screen	ESC]
Print cursor line	ESC V

Reports

Name	Sequence
Identify (what are you)	ESC Z
Response: VT102	ESC / Z

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