digital

EK-VT125-RC-001

VT125 PROGRAMMING REFERENCE CARD

CONTROL CHARACTERS RECEIVED

Name	Character Mnemonic	Octal Code	Function
Null	NUL	000	Ignored when received and used as a fill character.
Enquire	ENQ	005	Transmits the answerback message.
Bell	BEL	007	Generates a bell tone.
Backspace	BS	010	Moves the cursor to the left one character position.
Horizontal Tab	HT	011	Moves the cursor to the next tab stop.
Line Feed	LF	012	Causes a line feed or a new line operation. (Refer to Linefeed/ New Line mode.)
Vertical Tab	VT	013	Processed as LF.
Form Feed	FF	014	Processed as LF.
Carriage Return	CR	015	Moves the cursor to left margin on the current line.
Shift Out	SO	016	Selects the G1 character set, as designated by a Select Character Set sequence.
Shift In	SI	017	Selects the G0 character set, as designated by a Select Character Set sequence.
Device Control 1	DC1	021	Processed as XON. Causes the terminal to continue transmitting characters.

Name	Character Mnemonic	Octal Code	Function
Device Control 3	DC3	023	Processed as XOFF. Causes terminal to stop transmitting all characters except XOFF and XON.
Cancel	CAN	030	If received during an escape or control sequence, the sequence is cancelled and substitution character (▒) is displayed.
Substitute	SUB	032	Processed as CAN.
Escape	ESC	033	Processed as a sequence introducer.
Delete	DEL	177	Ignored when received.

ANSI COMPATIBLE SEQUENCES

Set Mode

Name	Mnemonic	Mode	Sequence
Line feed/new line	LMN	New line	ESC [20 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

Reset Mode

Name	Mnemonic	Mode	Sequence*
Line feed/new line	LMN	Line feed	ESC [20 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

* The last character of each sequence is lowercase L (154_8)

Cursor Key Codes Generated

	ANSI Codes		VT52 Codes
Cursor Key (Arrow)	**Reset (Cursor)**	**Set (Application)**	
Up	ESC [A	ESC O A	ESC A
Down	ESC [B	ESC O B	ESC B
Right	ESC [C	ESC O C	ESC C
Left	ESC [D	ESC O D	ESC D

Keypad Character Selection

Name	Mnemonic	Sequence
Alternate	DECKPAM	ESC =
Numeric	DECKPNM	ESC >

Keypad Codes Generated

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

* The last character of the sequence is lowercase L (154_8)

† These sequences were not available in the VT52. Do not use the PF4, "–" (minus), or "," (comma) keys with VT52 software.

‡ Line feed/new line off causes ENTER to generate CR (015_8). On causes ENTER to generate CRLF (015_8 012_8).

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 – special characters	ESC (2	ESC) 2

Name	Mnemonic	Sequence
Single Shift 2 Single character shift to G2 (ASCII)	SS2	ESC N
Single Shift 3 Single character shift to G3 (ASCII)	SS3	ESC O

NOTE: The VT125 generates the following control characters differently from previous DIGITAL terminals.

Code	VT125 Keys	Previous Terminal Keys
NUL	CTRL – Space bar	CTRL – @
RS	CTRL – ~	CTRL – ^
US	CTRL – ?	CTRL – _

Character Attributes

Name	Mnemonic	Sequence
Select Graphic Rendition	SGR	–
No attributes	–	ESC [m
No attributes	–	ESC [0 m
Select bold attribute	–	ESC [1 m
Select underline attribute	–	ESC [4 m
Select blink attribute	–	ESC [5 m
Select reverse video attribute	–	ESC [7 m

NOTE: Without advance video option (AVO), only underline or reverse attribute is available.

US/UK Character Set

B7 B6 B5 / BITS B4 B3 B2 B1	ROW	COLUMN 0	1	2	3	4	5	6	7
0 0 0 0	0	NUL 0 0 0 20 16 10	 0 0 1 40 32 20	SP 0 1 0 60 48 30	0 0 1 1 100 64 40	@ 1 0 0 120 80 50	P 1 0 1 140 96 60	` 1 1 0 160 112 70	p 1 1 1 180 112 70
0 0 0 1	1	 1 0 0 21 17 11	DC1 (XON) 1 0 1 41 33 21	! 1 1 0 61 49 31	1 1 1 1 101 65 41	A 120 80 50	Q 121 81 51	a 141 97 61	q 161 113 71
0 0 1 0	2	 2 2 2 22 18 12	" 42 34 22	2 62 50 32	B 102 66 42	R 122 82 52	b 142 98 62	r 162 114 72	
0 0 1 1	3	 3 3 3 23 19 13	DC3 (XOFF) 43 35 23	* # £ 3 63 51 33	C 103 67 43	S 123 83 53	c 143 99 63	s 163 115 73	
0 1 0 0	4	 4 4 4 24 20 14	$ 44 36 24	4 64 52 34	D 104 68 44	T 124 84 54	d 144 100 64	t 164 116 74	
0 1 0 1	5	ENQ 5 5 5 25 21 15	% 45 37 25	5 65 53 35	E 105 69 45	U 125 85 55	e 145 101 65	u 165 117 75	
0 1 1 0	6	 6 6 6 26 22 16	& 46 38 26	6 66 54 36	F 106 70 46	V 126 86 56	f 146 102 66	v 166 118 76	
0 1 1 1	7	BEL 7 7 7 27 23 17	' 47 39 27	7 67 55 37	G 107 71 47	W 127 87 57	g 147 103 67	w 167 119 77	
1 0 0 0	8	BS 10 8 8 30 24 18	CAN (50 40 28	8 70 56 38	H 110 72 48	X 130 88 58	h 150 104 68	x 170 120 78	
1 0 0 1	9	HT 11 9 9 31 25 19	) 51 41 29	9 71 57 39	I 111 73 49	Y 131 89 59	i 151 105 69	y 171 121 79	
1 0 1 0	10	LF 12 10 A 32 26 1A	SUB * 52 42 2A	: 72 58 3A	J 112 74 4A	Z 132 90 5A	j 152 106 6A	z 172 122 7A	
1 0 1 1	11	VT 13 11 B 33 27 1B	ESC + 53 43 2B	; 73 59 3B	K 113 75 4B	[133 91 5B	k 153 107 6B	{ 173 123 7B	
1 1 0 0	12	FF 14 12 C 34 28 1C	, 54 44 2C	< 74 60 3C	L 114 76 4C	\ 134 92 5C	l 154 108 6C	| 174 124 7C	
1 1 0 1	13	CR 15 13 D 35 29 1D	- 55 45 2D	= 75 61 3D	M 115 77 4D	] 135 93 5D	m 155 109 6D	} 175 125 7D	
1 1 1 0	14	SO 16 14 E 36 30 1E	. 56 46 2E	> 76 62 3E	N 116 78 4E	^ 136 94 5E	n 156 110 6E	~ 176 126 7E	
1 1 1 1	15	SI 17 15 F 37 31 1F	/ 57 47 2F	? 77 63 3F	O 117 79 4F	_ 137 95 5F	o 157 111 6F	DEL 177 127 7F	

*NOTE DEPENDS ON THE CHARACTER SET SELECTED. U.S.=# U.K.=£

KEY

ASCII CHARACTER **ESC** 33 OCTAL / 27 DECIMAL / 1B HEX

MA 7247A

Special Characters and Line Drawing Set

B7 B6 B5 / BITS B4 B3 B2 B1	ROW	COLUMN 0	1	2	3	4	5	6	7
0 0 0 0	0	NUL 0 0 0	20 16 10	SP 40 32 20	0 60 48 30	@ 100 64 40	P 120 80 50	` 140 96 60	— 160 112 70 SCAN 3
0 0 0 1	1	DC1 (XON) 1 1 1	21 17 11	! 41 33 21	1 61 49 31	A 101 65 41	Q 121 81 51	a 141 97 61	— 161 113 71 SCAN 5
0 0 1 0	2	2 2 2	22 18 12	" 42 34 22	2 62 50 32	B 102 66 42	R 122 82 52	b 142 98 62	— 162 114 72 SCAN 7
0 0 1 1	3	DC3 (XOFF) 3 3 3	23 19 13	# 43 35 23	3 63 51 33	C 103 67 43	S 123 83 53	c 143 99 63	— 163 115 73 SCAN 9
0 1 0 0	4	4 4 4	24 20 14	$ 44 36 24	4 64 52 34	D 104 68 44	T 124 84 54	d 144 100 64	┼ 164 116 74
0 1 0 1	5	ENQ 5 5 5	25 21 15	% 45 37 25	5 65 53 35	E 105 69 45	U 125 85 55	e 145 101 65	┤ 165 117 75
0 1 1 0	6	6 6 6	26 22 16	& 46 38 26	6 66 54 36	F 106 70 46	V 126 86 56	f 146 102 66	┴ 166 118 76
0 1 1 1	7	BEL 7 7 7	27 23 17	' 47 39 27	7 67 55 37	G 107 71 47	W 127 87 57	g 147 103 67	┬ 167 119 77
1 0 0 0	8	BS 10 8 8	CAN 30 24 18	(50 40 28	8 70 56 38	H 110 72 48	X 130 88 58	h 150 104 68	│ 170 120 78
1 0 0 1	9	HT 11 9 9	31 25 19	) 51 41 29	9 71 57 39	I 111 73 49	Y 131 89 59	i 151 105 69	≤ 171 121 79
1 0 1 0	10	LF 12 10 A	SUB 32 26 1A	* 52 42 2A	: 72 58 3A	J 112 74 4A	Z 132 90 5A	j 152 106 6A	≥ 172 122 7A
1 0 1 1	11	VT 13 11 B	ESC 33 27 1B	+ 53 43 2B	; 73 59 3B	K 113 75 4B	[133 91 5B	k 153 107 6B	π 173 123 7B
1 1 0 0	12	FF 14 12 C	34 28 1C	, 54 44 2C	< 74 60 3C	L 114 76 4C	\ 134 92 5C	l 154 108 6C	≠ 174 124 7C
1 1 0 1	13	CR 15 13 D	35 29 1D	- 55 45 2D	= 75 61 3D	M 115 77 4D	] 135 93 5D	m 155 109 6D	£ 175 125 7D
1 1 1 0	14	SO 16 14 E	36 30 1E	. 56 46 2E	> 76 62 3E	N 116 78 4E	^ 136 94 5E	n 156 110 6E	· 176 126 7E
1 1 1 1	15	SI 17 15 F	37 31 1F	/ 57 47 2F	? 77 63 3F	O 117 79 4F	(BLANK) 137 95 5F	o 157 111 6F SCAN 1	DEL 177 127 7F

KEY

ASCII CHARACTER — ESC — 33 OCTAL / 27 DECIMAL / 1B HEX

MA 1249

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 [Pl ; 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	DECDHL	ESC # 3
Double-height bottom half	DECDHL	ESC # 4
Single-width single-height	DECSWL	ESC # 5
Double-width single-height	DECDWL	ESC # 6

Erasing

Name	Mnemonic	Sequence
Erase in line	EL	–
Cursor to end of line	–	ESC [K
Cursor to end of line	–	ESC [0 K
Beginning of line to cursor	–	ESC [1 K
Entire line containing cursor	–	ESC [2 K
Erase in display	ED	–
Cursor to end of screen	–	ESC [J
Cursor to end of screen	–	ESC [0 J
Beginning of screen to cursor	–	ESC [1 J
Entire screen	–	ESC [2 J

Communication and Graphics Protocol Commands

Name	Mnemonic	Sequence
Device control string	DCS	–
Enter ReGIS at previous command level	–	ESC P p
Enter ReGIS at highest command level	–	ESC P 1 p
Enter ReGIS at previous command level with commands to screen	–	ESC P 2 p
Enter ReGIS at highest command level with commands to screen	–	ESC P 3 p
Enter DECwriter graphics	–	ESC P q
Enter VT105 emulator	–	ESC P t
String terminator	ST	–
Exit graphics	–	ESC \
Media copy	MC	–
Turn off computer to auxiliary port	–	ESC [4 i
Turn on computer to auxiliary port	–	ESC [5 i
Turn off computer to screen	–	ESC [6 i
Turn on computer to screen	–	ESC [7 i
Select auxiliary port for ReGIS hardcopy output	–	ESC [? 0 i
Select computer port for ReGIS hardcopy output	–	ESC [? 2 i

Reports

Name	Mnemonic	Sequence
Device status report (request status of VT125)	DSR	ESC [5 n
Response:		
Terminal OK	DSR	ESC [0 n
Terminal not OK	DSR	ESC [3 n
Device status report (request cursor position)	DSR	ESC [6 n
Cursor position report	CPR	ESC [Pl ; 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: VT125	DA	See Note.

NOTE: Format is ESC [? 12 ; <vt100> ; <vt125> ; <version> c

<vt100>	5 = no AVO, 7 = AVO
<vt125>	1 = printer, 0 = no printer
<version>	Graphics firmware

Reset

Name	Mnemonic	Sequence
Reset to initial state	RIS	ESC c

VT100 Tests and Adjustments

NOTE: Do not use VT100 loopback tests with the graphics processor installed. Loopback tests require test connector. Continuous tests end at failure or power-off.

Name	Mnemonic	Sequence
Screen alignment display	DECALN	–
Fill screen with "Es"	–	ESC # 8
Invoke confidence test	DECTST	–
Power-up test	–	ESC [2 ; 1 y
Data loopback test	–	ESC [2 ; 2 y
Power-up and data loopback tests	–	ESC [2 ; 3 y
EIA modem control loopback test	–	ESC [2 ; 4 y
Power-up and EIA loopback tests	–	ESC [2 ; 5 y
Data loopback and EIA loopback tests	–	ESC [2 ; 6 y
Power-up, data loopback, and EIA loopback tests	–	ESC [2 ; 7 y
Repeat power-up test continuously	–	ESC [2 ; 9 y
Repeat data loopback test continuously	–	ESC [2 ; 10 y
Repeat power-up and data loopback tests continuously	–	ESC [2 ; 11 y
Repeat EIA test continuously	–	ESC [2 ; 12 y
Repeat power-up and EIA tests continuously	–	ESC [2 ; 13 y
Repeat data loopback and EIA loopback tests continuously	–	ESC [2 ; 14 y
Repeat power-up, data loopback, and EIA loopback tests continuously	–	ESC [2 ; 15 y

VT125 Tests and Adjustments

NOTE: All tests require loopback connector. Always include power-up test for correct display of error indications.

Name	Mnemonic	Sequence
Invoke confidence test	DECTST	ESC [4 ; 1 ; Ps . . . ; Ps y
VT125 power-up test	–	Ps = 1
VT125 computer port data loopback test	–	Ps = 2
VT125 auxiliary port data loopback test	–	Ps = 3
VT125 display test	–	Ps = 4
VT125 video bit map memory test	–	Ps = 5
Repeat any selected tests continuously until power-off or failure	–	Ps = 9

Keyboard Indicators

Name	Mnemonic	Sequence
Load LEDs	DECLL	–
All off	–	ESC [q
L1 on	–	ESC [1 q
L2 on	–	ESC [2 q
L3 on	–	ESC [3 q
L4 on	–	ESC [4 q

VT52 COMPATIBLE MODE

Mode	Sequence
Enter ANSI mode	ESC <

Keypad Character Selection

Name	Sequence
Enter alternate keypad mode	ESC =
Exit alternate keypad mode (numeric keypad mode)	ESC >

NOTE: VT52 alternate keypad and numeric keypad modes are different from ANSI.

Character Sets

Name	Sequence
Special graphics character set	ESC F*
Select US/UK character set (as determined by the US/UK character SET-UP feature)	ESC G

* Same as special character and line drawing set in ANSI mode.

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 Pl Pc†
Reverse line feed	ESC I‡

* 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 31_{10}. Line and column numbers start at one.

‡ The last character of the sequence is an uppercase i (111_8).

Erasing

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

Reports

Name	Sequence
Identify (what are you)	ESC Z
Response: VT52	ESC / Z

ReGIS COMMAND SUMMARY

Position Command Summary

Command	Function
P [ ]	Reset pattern memory.
[<position>]	Move to <position>.
<pixel vector> or <pv>	Move <multiplier> pixels in <pv> direction.
(B)	Save current location.
(S)	Save dummy location.
(E)	Move to last saved location.
(W (<temp. writing controls>))	P (W (M<multiplier>)).

Vector Command Summary

Command	Function
V [ ]	Draw dot at current position.
[<position>]	Draw vector to <position>.
<pixel vector> or <pv>	Draw <multiplier> pixels in <pv> direction.
(B)	Save current position.
(S)	Save dummy position.
(E)	Draw to last saved position.
(W (<temp. writing controls>))	

Curve Command Summary

Command	Function
C [<position>]	Circle with center at current position, circumference at <position>.
(C) [<position>]	Circle with center at <position>, circumference at current position.
(A<degrees>) [<position>]	Arc with center at current position, starting at <position> for <degrees>.
(A<degrees>C) [<position>]	Arc with center at <position>, starting at current position for <degrees>.
(B) [<pos.>] . . . [<pos.>] (E)	Bounded (closed) curve
(S) [ ] [<pos.>]. . . [<pos.>] [ ] (E)	Unbounded (open) curve
(W(<temp. writing controls>))	

Text Command Summary

Command

T (S <size number>)
(H <height>)
[<spacing>]
(S [<width in pixels>,<height in pixels>])
(M [<width pixel multiplier>,<height pixel multiplier>])
(D <direction angle>)
(D <string tilt> S <size> D <char tilt>)
(T <italic degrees>)
(A <pattern set number>)
((B) <temporary attributes block> (E))
(W(<temp. writing controls>))

Writing Controls Summary

Command				Function		
W (C)				Complement		
(E)				Erase		
(R)				Replace		
(V)				Overlay		
(F <foreground planes>)				0 = no planes 1 = plane 1 2 = plane 2 3 = planes 1 and 2		
				Foreground intensity:		
(I	0	or	(D))	Dark	or	Dark
	1		(R))	Dim grey		Red
	2		(G))	Light grey		Green
	3		(B))	White		Blue
			(C))			Cyan
			(Y))			Yellow
			(M))			Magenta
			(W))			White
or (I (H <hue angle> L <lightness percent> S <saturation percent>))						
(M <multiplier>)				Pixels per <pv>		
(N 1)				Negative on		
(N 0)				Negative off		
(S 1)				Shading on		
(S 0)				Shading off		
(S [,shading reference])						
(S 'shading character')						
(P <binary pattern>)				Enter pattern.		
(P <pattern number>)				Use VT125 pattern.		
(P (M <pattern multiplier>))						
(W<i>(P<j>,N<k>))				Custom writing control		

Screen Controls Summary

Command	Function
S <pixel vector> [<position>]	Scroll.
(A [<position>] [<position>])	Display addressing.
(E)	Erase screen.
(H [<position>] [<position>]	Hardcopy (corner positions optional)
(H(P[<position>]))	Set hardcopy offset.

(I	0	or	(D))	Background intensity: Dark	or Dark
	1		(R))	Dim grey	Red
	2		(G))	Light grey	Green
	3		(B))	White	Blue
			(C))		Cyan
			(Y))		Yellow
			(M))		Magenta
			(W))		White

or

(I (H <hue angle>
L <lightness percent>
S <saturation percent>))

S(M<n>(<mono HLS>)(A<color HLS>)) Output mapping

(S <scale>)
(S (X<scale>Y<scale>)
(T <ticks>) Time delay

Macrograph

Command	Function
@ .	Clear all macrographs.
:keyletter character_string @;	Define macrograph.
keyletter	Invoke macrograph.

Character Cell Control Summary

Command	Summary
L (A<integer>)	Select for loading.
(A"<name>")	Give name to set.
"<ASCII char>" <hex pair> . . . <hex pair>;	Load cell.

Report Command Summary

Command	Function
R (L)	Set selected for loading.
(M (<keyletter>))	Contents of macrograph.
(M (=))	Use of storage.
"<free>,<total>"	Reply to use.
(P)	Cursor position.

1st Edition, September 1981

Printed in U.S.A.