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VT420 Video Terminal
Programmer Reference Manual Update

EK–VT42P–UP. A01

Digital Equipment Corporation

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About This Guide

This update provides information on how to use the French Canadian, Greek, Hebrew, and Turkish keyboards and character sets with your terminal. This update supplements information contained in the *VT420 Programmer Reference Manual*, EK–VT420–RM.

Organization

The chapters in this update are arranged in the same logical order as the *VT420 Video Terminal Programmer Reference Manual.*

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Related Documentation

You can order the following VT420 update from Digital:

Installing and Using the VT420 Video Terminal with PC Terminal Mode Update	EK–VT42A–UP

Ordering Information

You can order documentation by phone or by mail as described in this section.

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If you need help deciding which documentation best meets your needs, call 800-DIGITAL (800-344-4825) and press 2 for technical assistance.

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If you wish to place an order through your account at the Electronic Store, dial 800-234-1998, using a modem set to 2400- or 9600-baud. You must be using a VT terminal or terminal emulator set at 8 bits, no parity. If you need assistance using the Electronic Store, call 800-DIGITAL (800-344-4825) and ask for an Electronic Store specialist.

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Part 1
Introduction to Your VT420 Terminal

1

VT420 Features

This chapter briefly describes the latest features of the VT420 worldwide model and the VT420 worldwide model with PC TERM mode.

Chapter 9 describes the VT420 terminal with PC TERM mode in detail.

New Features

You can enable the latest features of the VT420 worldwide models from the keyboard by using set-up.

Selecting a Keyboard Dialect

To select the correct keyboard dialect for your keyboard, use the **keyboard dialect** feature in the Set-Up Directory screen. Refer to the Getting Started chapter in the *Installing and Using the VT420 Video Terminal with PC Terminal*. You can choose one of the following additional selections for the **keyboard dialect**:

- French/Canadian
- Greek/N-A
- Hebrew/N-A
- Turkish-F
- Turkish-Q

Selecting a Character Set

After you set the keyboard dialect, you may want to choose an appropriate character set for your keyboard. You use the General Set-Up screen to choose from 8-bit multinational, 7-bit national, or PC character sets, as described in the Using Set-Up chapter of the *Installing and Using the VT420 Video Terminal With PC Terminal Mode Update.*

Following are the added 8-bit and PC character sets available from the **User-preferred Supplemental Set (UPSS)** in the General Set-Up screen:

	In VT Mode	**In PC TERM Mode**
Greek	UPSS ISO Latin-7 Supplemental	UPSS ISO Latin-7 Supplemental
	UPSS DEC Greek Supplemental	PC Greek
Hebrew	UPSS ISO Latin-Hebrew Supplemental	UPSS ISO Latin-Hebrew Supplemental
	UPSS DEC Hebrew Supplemental	PC Hebrew
Turkish	UPSS ISO Latin-5 Supplemental	UPSS ISO Latin-5 Supplemental
	UPSS DEC Turkish Supplemental	PC Turkish

For a complete description of the new set-up features, refer to your *Installing and Using the VT420 Video Terminal With PC Terminal Mode Update,* EK-VT42A-UP.

2

Character Encoding

This chapter describes the additional character sets you can use with your terminal: Greek, Hebrew, and Turkish character sets. The National Replacement Character Sets are abbreviated as NRCs.

See Chapter 9 for additional PC character sets available in PC TERM mode.

VT420 Character Sets

The terminal provides additional built-in character sets for the following languages:

Greek

- DEC Greek Supplemental
- ISO Latin-7
- ISO Latin-7 CRM
- 7-bit Greek NRCs

Hebrew

- DEC Hebrew Supplemental
- ISO Latin-Hebrew
- ISO Latin-Hebrew CRM
- 7-bit Hebrew NRCs

Turkish

- DEC Turkish Supplemental
- ISO Latin-5
- ISO Latin-5 CRM
- 7-bit Turkish NRCs

French/Canadian Character Sets

See the *VT420 Video Terminal Programmer Reference Manual* for the following French/Canadian supplemental character sets, which you use with the `French/Canadian` keyboard dialect:

- DEC Supplemental Graphic character set
- ISO Latin-1 character set

DEC and ISO Supplemental Character Sets

Together the ASCII set with one of the 8-bit supplemental sets or ISO Latin supplemental sets make up a multinational character set. The following relate to the Greek, Hebrew, and Turkish supplemental sets and ISO Latin supplemental sets. This chapter shows each supplemental character set.

- The 8-bit DEC supplemental character sets consist of 94 characters, and the ISO Latin supplemental character sets consist of 96 characters.
- You can select the 8-bit DEC supplemental sets or the ISO Latin supplemental sets as the default character set, either by defining it as the **UPSS** feature in the General Set-Up screen, or by assigning it with the DECAUPSS escape sequence (Chapter 5).
- The 8-bit supplemental sets and the ISO Latin supplemental sets are not available in 7-bit mode, for example, VT100 mode.
- The *Installing and Using the VT420 Video Terminal with PC Terminal Mode Update* lists the 8-bit DEC supplemental characters and the ISO Latin supplemental characters.

Greek Character Sets

Figure 2–1 shows the DEC Greek Supplemental character set.

Figure 2–1 DEC Greek Supplemental Character Set

Row	Column 8	9	10	11	12	13	14	15
0	200 128 080	DCS 220 144 090	NBSP 240 160 0A0	° 260 176 0B0	ï 300 192 0C0	 320 208 0D0	ü 340 224 0E0	 360 240 0F0
1	201 129 081	PU1 221 145 091	¡ 241 161 0A1	± 261 177 0B1	A 301 193 0C1	P 321 209 0D1	a 341 225 0E1	p 361 241 0F1
2	202 130 082	PU2 222 146 092	¢ 242 162 0A2	2 262 178 0B2	B 302 194 0C2	R 322 210 0D2	b 342 226 0E2	r 362 242 0F2
3	203 131 083	STS 223 147 093	£ 243 163 0A3	3 263 179 0B3	G 303 195 0C3	S 323 211 0D3	g 343 227 0E3	s 363 243 0F3
4	IND 204 132 084	CCH 224 148 094	 244 164 0A4	 264 180 0B4	D 304 196 0C4	T 324 212 0D4	d 344 228 0E4	t 364 244 0F4
5	NEL 205 133 085	MW 225 149 095	¥ 245 165 0A5	µ 265 181 0B5	E 305 197 0C5	U 325 213 0D5	e 345 229 0E5	u 365 245 0F5
6	SSA 206 134 086	SPA 226 150 096	 246 166 0A6	¶ 266 182 0B6	Z 306 198 0C6	F 326 214 0D6	z 346 230 0E6	f 366 246 0F6
7	ESA 207 135 087	EPA 227 151 097	§ 247 167 0A7	· 267 183 0B7	H 307 199 0C7	C 327 215 0D7	h 347 231 0E7	c 367 247 0F7
8	HTS 210 136 088	 230 152 098	¤ 250 168 0AB	 270 184 0B8	Q 310 200 0C8	Y 330 216 0D8	q 350 232 0E8	y 370 248 0F8
9	HTJ 211 137 089	 231 153 099	© 251 169 0A9	1 271 185 0B9	I 311 201 0C9	W 331 217 0D9	i 351 233 0E9	w 371 249 0F9
10	VTS 212 138 08A	 232 154 09A	a 252 170 0AA	o 272 186 0BA	K 312 202 0CA	á 332 218 0DA	k 352 234 0EA	V 372 250 0FA
11	PLD 213 139 08B	CSI 233 155 09B	« 253 171 0AB	» 273 187 0BB	L 313 203 0CB	é 333 219 0DB	l 353 235 0EB	ú 373 251 0FB
12	PLU 214 140 08C	ST 234 156 09C	 254 172 0AC	¼ 274 188 0BC	M 314 204 0CC	ń 334 220 0DC	m 354 236 0EC	ẃ 374 252 0FC
13	RI 215 141 08D	OSC 235 157 09D	 255 173 0AD	½ 275 189 0BD	N 315 205 0CD	í 335 221 0DD	n 355 237 0ED	´ 375 253 0FD
14	SS2 216 142 08E	PM 236 158 09E	 256 174 0AE	 276 190 0BE	X 316 206 0CE	 336 222 0DE	x 356 238 0EE	 376 254 0FE
15	SS3 217 143 08F	APC 237 159 09F	 257 175 0AF	¿ 277 191 0BF	O 317 207 0CF	ó 337 223 0DF	o 357 239 0EF	 377 255 0FF

LEGEND

ESC	033 027 01B	Octal Decimal Hexadecimal

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Figure 2–2 shows the ISO Latin-7 character set.

Figure 2–2 ISO Latin-7 Character Set

Row	Column 8		9		10		11		12		13		14		15	
0		200 128 080	DCS	220 144 090	NBSP	240 160 0A0	°	260 176 0B0	í	300 192 0C0	P	320 208 0D0	ú́	340 224 0E0	p	360 240 0F0
1		201 129 081	PU1	221 145 091	‘	241 161 0A1	±	261 177 0B1	A	301 193 0C1	R	321 209 0D1	a	341 225 0E1	r	361 241 0F1
2		202 130 082	PU2	222 146 092	’	242 162 0A2	2	262 178 0B2	B	302 194 0C2		322 210 0D2	b	342 226 0E2	V	362 242 0F2
3		203 131 083	STS	223 147 093	£	243 163 0A3	3	263 179 0B3	G	303 195 0C3	S	323 211 0D3	g	343 227 0E3	s	363 243 0F3
4	IND	204 132 084	CRH	224 148 094		244 164 0A4	´	264 180 0B4	D	304 196 0C4	T	324 212 0D4	d	344 228 0E4	t	364 244 0F4
5	NEL	205 133 085	MW	225 149 095		245 165 0A5	·́	265 181 0B5	E	305 197 0C5	U	325 213 0D5	e	345 229 0E5	u	365 245 0F5
6	SSA	206 134 086	SPA	226 150 096	¦	246 166 0A6	Á	266 182 0B6	Z	306 198 0C6	F	326 214 0D6	z	346 230 0E6	f	366 246 0F6
7	ESA	207 135 087	EPA	227 151 097	§	247 167 0A7	·	267 183 0B7	H	307 199 0C7	C	327 215 0D7	h	347 231 0E7	c	367 247 0F7
8	HTS	210 136 088		230 152 098	¨	250 168 0A8	É	270 184 0B8	Q	310 200 0C8	Y	330 216 0D8	q	350 232 0E8	y	370 248 0F8
9	HTJ	211 137 089		231 153 099	©	251 169 0A9	Ḧ	271 185 0B9	I	311 201 0C9	W	331 217 0D9	i	351 233 0E9	w	371 249 0F9
10	VTS	212 138 08A		232 154 09A		252 170 0AA	Í	272 186 0BA	K	312 202 0CA	ẗ	332 218 0DA	k	352 234 0EA	ẗ	372 250 0FA
11	PLD	213 139 08B	CSI	233 155 09B	«	253 171 0AB	»	273 187 0BB	L	313 203 0CB	Ü	333 219 0DB	l	353 235 0EB	ü	373 251 0FB
12	PLU	214 140 08C	ST	234 156 09C	¬	254 172 0AC	Ó	274 188 0BC	M	314 204 0CC	á	334 220 0DC	m	354 236 0EC	ó	374 252 0FC
13	RI	215 141 08D	OSC	235 157 09D	SHY	255 173 0AD	½	275 189 0BD	N	315 205 0CD	é	335 221 0DD	n	355 237 0ED	ú	375 253 0FD
14	SS2	216 142 08E	PM	236 158 09E		256 174 0AE	Ú	276 190 0BE	X	316 206 0CE	ḧ	336 222 0DE	x	356 238 0EE	ẃ	376 254 0FE
15	SS3	217 143 08F	APC	237 159 09F	–	257 175 0AF	Ẅ	277 191 0BF	O	317 207 0CF	í	337 223 0DF	o	357 239 0EF		377 255 0FF

LEGEND

ESC	033 027 01B	Octal Decimal Hexadecimal

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You can use the ISO Latin-7 control representation mode (CRM) character set to display control characters. Normally, control characters are interpreted as commands rather than being displayed. To select this set, you would select the UPSS ISO Latin-7 set in the General Set-Up screen and select the Display Controls setting in the Display Set-Up screen.

Figure 2–3 shows the ISO Latin-7 CRM character set.

Figure 2–3 ISO Latin-7 CRM Character Set

Row	Column 8		9		10		11		12		13		14		15	
0	80	200 128 080	DCS	220 144 090	NBSP	240 160 0A0	°	260 176 0B0	İ	300 192 0C0	P	320 208 0D0	ű	340 224 0E0	p	360 240 0F0
1	81	201 129 081	PU1	221 145 091	‘	241 161 0A1	±	261 177 0B1	A	301 193 0C1	R	321 209 0D1	a	341 225 0E1	r	361 241 0F1
2	82	202 130 082	PU2	222 146 092	’	242 162 0A2	2	262 178 0B2	B	302 194 0C2	D3	322 210 0D2	b	342 226 0E2	V	362 242 0F2
3	83	203 131 083	STS	223 147 093	£	243 163 0A3	3	263 179 0B3	G	303 195 0C3	S	323 211 0D3	g	343 227 0E3	s	363 243 0F3
4	IND	204 132 084	CRH	224 148 094	A4	244 164 0A4	´	264 180 0B4	D	304 196 0C4	T	324 212 0D4	d	344 228 0E4	t	364 244 0F4
5	NEL	205 133 085	MW	225 149 095	A5	245 165 0A5	·̓	265 181 0B5	E	305 197 0C5	U	325 213 0D5	e	345 229 0E5	u	365 245 0F5
6	SSA	206 134 086	SPA	226 150 096	¦	246 166 0A6	Á	266 182 0B6	Z	306 198 0C6	F	326 214 0D6	z	346 230 0E6	f	366 246 0F6
7	ESA	207 135 087	EPA	227 151 097	§	247 167 0A7	·	267 183 0B7	H	307 199 0C7	C	327 215 0D7	h	347 231 0E7	c	367 247 0F7
8	HTS	210 136 088	98	230 152 098	A8	250 168 0A8	É	270 184 0B8	Q	310 200 0C8	Y	330 216 0D8	q	350 232 0E8	y	370 248 0F8
9	HTJ	211 137 089	99	231 153 099	©	251 169 0A9	Ḧ	271 185 0B9	I	311 201 0C9	W	331 217 0D9	i	351 233 0E9	w	371 249 0F9
10	VTS	212 138 08A	9A	232 154 09A	AA	252 170 0AA	Í	272 186 0BA	K	312 202 0CA	Ï	332 218 0DA	k	352 234 0EA	ï	372 250 0FA
11	PLD	213 139 08B	CSI	233 155 09B	«	253 171 0AB	»	273 187 0BB	L	313 203 0CB	Ü	333 219 0DB	l	353 235 0EB	ü	373 251 0FB
12	PLU	214 140 08C	ST	234 156 09C	¬	254 172 0AC	Ó	274 188 0BC	M	314 204 0CC	á	334 220 0DC	m	354 236 0EC	ó	374 252 0FC
13	RI	215 141 08D	OSC	235 157 09D	SHY	255 173 0AD	½	275 189 0BD	N	315 205 0CD	é	335 221 0DD	n	355 237 0ED	ú	375 253 0FD
14	SS2	216 142 08E	PM	236 158 09E	AE	256 174 0AE	Ú	276 190 0BE	X	316 206 0CE	ḧ	336 222 0DE	x	356 238 0EE	ẃ	376 254 0FE
15	SS3	217 143 08F	APC	237 159 09F	—	257 175 0AF	Ẃ	277 191 0BF	O	317 207 0CF	í	337 223 0DF	o	357 239 0EF	FF	377 255 0FF

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ESC	033 027 01B	Octal Decimal Hexadecimal

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Hebrew Character Sets

Figure 2–4 shows the DEC Hebrew Supplemental character set.

Figure 2–4 DEC Hebrew Supplemental Character Set

Row	Column 8	9	10	11	12	13	14	15
0	200 128 080	DCS 220 144 090	240 160 0A0	260 176 0B0	300 192 0C0	320 208 0D0	340 224 0E0	360 240 0F0
1	201 129 081	PU1 221 145 091	¡ 241 161 0A1	261 177 0B1	301 193 0C1	321 209 0D1	341 225 0E1	361 241 0F1
2	202 130 082	PU2 222 146 092	242 162 0A2	262 178 0B2	302 194 0C2	322 210 0D2	342 226 0E2	362 242 0F2
3	203 131 083	STS 223 147 093	243 163 0A3	263 179 0B3	303 195 0C3	323 211 0D3	343 227 0E3	363 243 0F3
4	IND 204 132 084	CRH 224 148 094	244 164 0A4	264 180 0B4	304 196 0C4	324 212 0D4	344 228 0E4	364 244 0F4
5	NEL 205 133 085	MW 225 149 095	245 165 0A5	265 181 0B5	305 197 0C5	325 213 0D5	345 229 0E5	365 245 0F5
6	SSA 206 134 086	SPA 226 150 096	246 166 0A6	266 182 0B6	306 198 0C6	326 214 0D6	346 230 0E6	366 246 0F6
7	ESA 207 135 087	EPA 227 151 097	247 167 0A7	267 183 0B7	307 199 0C7	327 215 0D7	347 231 0E7	367 247 0F7
8	HTS 210 136 088	230 152 098	250 168 0A8	270 184 0B8	310 200 0C8	330 216 0D8	350 232 0E8	370 248 0F8
9	HTJ 211 137 089	231 153 099	251 169 0A9	271 185 0B9	311 201 0C9	331 217 0D9	351 233 0E9	371 249 0F9
10	VTS 212 138 08A	232 154 09A	a 252 170 0AA	o 272 186 0BA	312 202 0CA	332 218 0DA	352 234 0EA	372 250 0FA
11	PLD 213 139 08B	CSI 233 155 09B	253 171 0AB	273 187 0BB	313 203 0CB	333 219 0DB	353 235 0EB	373 251 0FB
12	PLU 214 140 08C	ST 234 156 09C	254 172 0AC	274 188 0BC	314 204 0CC	334 220 0DC	354 236 0EC	374 252 0FC
13	RI 215 141 08D	OSC 235 157 09D	255 173 0AD	275 189 0BD	315 205 0CD	335 221 0DD	355 237 0ED	375 253 0FD
14	SS2 216 142 08E	PM 236 158 09E	256 174 0AE	276 190 0BE	316 206 0CE	336 222 0DE	356 238 0EE	376 254 0FE
15	SS3 217 143 08F	APC 237 159 09F	257 175 0AF	¿ 277 191 0BF	317 207 0CF	337 223 0DF	357 239 0EF	377 255 0FF

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ESC	033 027 01B	Octal Decimal Hexadecimal

LJ–02461–RAGS

Figure 2–5 shows the ISO Latin-Hebrew character set.

Figure 2–5 ISO Latin-Hebrew Character Set

Row	Column 8	9	10	11	12	13	14	15
0	200 128 080	DCS 220 144 090	240 160 0A0	260 176 0B0	300 192 0C0	320 208 0D0	340 224 0E0	360 240 0F0
1	201 129 081	PU1 221 145 091	241 161 0A1	261 177 0B1	301 193 0C1	321 209 0D1	341 225 0E1	361 241 0F1
2	202 130 082	PU2 222 146 092	242 162 0A2	262 178 0B2	302 194 0C2	322 210 0D2	342 226 0E2	362 242 0F2
3	203 131 083	STS 223 147 093	243 163 0A3	263 179 0B3	303 195 0C3	323 211 0D3	343 227 0E3	363 243 0F3
4	IND 204 132 084	CRH 224 148 094	244 164 0A4	264 180 0B4	304 196 0C4	324 212 0D4	344 228 0E4	364 244 0F4
5	NEL 205 133 085	MW 225 149 095	245 165 0A5	265 181 0B5	305 197 0C5	325 213 0D5	345 229 0E5	365 245 0F5
6	SSA 206 134 086	SPA 226 150 096	246 166 0A6	266 182 0B6	306 198 0C6	326 214 0D6	346 230 0E6	366 246 0F6
7	ESA 207 135 087	EPA 227 151 097	247 167 0A7	267 183 0B7	307 199 0C7	327 215 0D7	347 231 0E7	367 247 0F7
8	HTS 210 136 088	230 152 098	250 168 0A8	270 184 0B8	310 200 0C8	330 216 0D8	350 232 0E8	370 248 0F8
9	HTJ 211 137 089	231 153 099	251 169 0A9	271 185 0B9	311 201 0C9	331 217 0D9	351 233 0E9	371 249 0F9
10	VTS 212 138 08A	232 154 09A	252 170 0AA	272 186 0BA	312 202 0CA	332 218 0DA	352 234 0EA	372 250 0FA
11	PLD 213 139 08B	CSI 233 155 09B	253 171 0AB	273 187 0BB	313 203 0CB	333 219 0DB	353 235 0EB	373 251 0FB
12	PLU 214 140 08C	ST 234 156 09C	254 172 0AC	274 188 0BC	314 204 0CC	334 220 0DC	354 236 0EC	374 252 0FC
13	RI 215 141 08D	OSC 235 157 09D	255 173 0AD	275 189 0BD	315 205 0CD	335 221 0DD	355 237 0ED	375 253 0FD
14	SS2 216 142 08E	PM 236 158 09E	256 174 0AE	276 190 0BE	316 206 0CE	336 222 0DE	356 238 0EE	376 254 0FE
15	SS3 217 143 08F	APC 237 159 09F	257 175 0AF	277 191 0BF	317 207 0CF	= 337 223 0DF	357 239 0EF	377 255 0FF

LEGEND

ESC	033 027 01B

Octal
Decimal
Hexadecimal

LJ–02462–RAGS

Figure 2–6 shows the ISO Latin-Hebrew CRM character set.

Figure 2–6 ISO Latin-Hebrew CRM Character Set

Row	Column 8		9		10		11		12		13		14		15	
0	80	200 128 080	DCS	220 144 090	NBSP	240 160 0A0		260 176 0B0	C0	300 192 0C0	D0	320 208 0D0		340 224 0E0		360 240 0F0
1	81	201 129 081	PU1	221 145 091	A1	241 161 0A1		261 177 0B1	C1	301 193 0C1	D1	321 209 0D1		341 225 0E1		361 241 0F1
2	82	202 130 082	PU2	222 146 092		242 162 0A2		262 178 0B2	C2	302 194 0C2	D2	322 210 0D2		342 226 0E2		362 242 0F2
3	83	203 131 083	STS	223 147 093		243 163 0A3		263 179 0B3	C3	303 195 0C3	D3	323 211 0D3		343 227 0E3		363 243 0F3
4	IND	204 132 084	CRH	224 148 094		244 164 0A4		264 180 0B4	C4	304 196 0C4	D4	324 212 0D4		344 228 0E4		364 244 0F4
5	NEL	205 133 085	MW	225 149 095		245 165 0A5		265 181 0B5	C5	305 197 0C5	D5	325 213 0D5		345 229 0E5		365 245 0F5
6	SSA	206 134 086	SPA	226 150 096		246 166 0A6		266 182 0B6	C6	306 198 0C6	D6	326 214 0D6		346 230 0E6		366 246 0F6
7	ESA	207 135 087	EPA	227 151 097		247 167 0A7		267 183 0B7	C7	307 199 0C7	D7	327 215 0D7		347 231 0E7		367 247 0F7
8	HTS	210 136 088	98	230 152 098		250 168 0A8		270 184 0B8	C8	310 200 0C8	D8	330 216 0D8		350 232 0E8		370 248 0F8
9	HTJ	211 137 089	99	231 153 099		251 169 0A9		271 185 0B9	C9	311 201 0C9	D9	331 217 0D9		351 233 0E9		371 249 0F9
10	VTS	212 138 08A	9A	232 154 09A		252 170 0AA		272 186 0BA	CA	312 202 0CA	DA	332 218 0DA		352 234 0EA		372 250 0FA
11	PLD	213 139 08B	CSI	233 155 09B		253 171 0AB		273 187 0BB	CB	313 203 0CB	DB	333 219 0DB		353 235 0EB	FB	373 251 0FB
12	PLU	214 140 08C	ST	234 156 09C		254 172 0AC		274 188 0BC	CC	314 204 0CC	DC	334 220 0DC		354 236 0EC	FC	374 252 0FC
13	RI	215 141 08D	OSC	235 157 09D		255 173 0AD		275 189 0BD	CD	315 205 0CD	DD	335 221 0DD		355 237 0ED	FD	375 253 0FD
14	SS2	216 142 08E	PM	236 158 09E		256 174 0AE		276 190 0BE	CE	316 206 0CE	DE	336 222 0DE		356 238 0EE	FE	376 254 0FE
15	SS3	217 143 08F	APC	237 159 09F		257 175 0AF	BF	277 191 0BF	CF	317 207 0CF	=	337 223 0DF		357 239 0EF	FF	377 255 0FF

LEGEND

ESC	033 027 01B	Octal Decimal Hexadecimal

LJ−02463−RAGS

Turkish Character Sets

Figure 2–7 shows the 8-bit Turkish Supplemental character set.

Figure 2–7 8-bit Turkish Supplemental Set

Row	Column 8		9		10		11		12		13		14		15	
0		200 128 080	DCS	220 144 090		240 160 0A0	°	260 176 0B0	À	300 192 0C0	Ğ	320 208 0D0	à	340 224 0E0	ğ	360 240 0F0
1		201 129 081	PU1	221 145 091	¡	241 161 0A1	±	261 177 0B1	Á	301 193 0C1	Ñ	321 209 0D1	á	341 225 0E1	ñ	361 241 0F1
2		202 130 082	PU2	222 146 092	¢	242 162 0A2	2	262 178 0B2	Â	302 194 0C2	Ò	322 210 0D2	â	342 226 0E2	ò	362 242 0F2
3		203 131 083	STS	223 147 093	£	243 163 0A3	3	263 179 0B3	Ã	303 195 0C3	Ó	323 211 0D3	ã	343 227 0E3	ó	363 243 0F3
4	IND	204 132 084	CRH	224 148 094		244 164 0A4		264 180 0B4	Ä	304 196 0C4	Ô	324 212 0D4	ä	344 228 0E4	ô	364 244 0F4
5	NEL	205 133 085	MW	225 149 095	¥	245 165 0A5	µ	265 181 0B5	Å	305 197 0C5	Õ	325 213 0D5	å	345 229 0E5	õ	365 245 0F5
6	SSA	206 134 086	SPA	226 150 096		246 166 0A6	¶	266 182 0B6	Æ	306 198 0C6	Ö	326 214 0D6	æ	346 230 0E6	ö	366 246 0F6
7	ESA	207 135 087	EPA	227 151 097	§	247 167 0A7	·	267 183 0B7	Ç	307 199 0C7	Œ	327 215 0D7	ç	347 231 0E7	œ	367 247 0F7
8	HTS	210 136 088		230 152 098	¤	250 168 0A8		270 184 0B8	È	310 200 0C8	Ø	330 216 0D8	è	350 232 0E8	ø	370 248 0F8
9	HTJ	211 137 089		231 153 099	©	251 169 0A9	1	271 185 0B9	É	311 201 0C9	Ù	331 217 0D9	é	351 233 0E9	ù	371 249 0F9
10	VTS	212 138 08A		232 154 09A	a	252 170 0AA	o	272 186 0BA	Ê	312 202 0CA	Ú	332 218 0DA	ê	352 234 0EA	ú	372 250 0FA
11	PLD	213 139 08B	CSI	233 155 09B	«	253 171 0AB	»	273 187 0BB	Ë	313 203 0CB	Û	333 219 0DB	ë	353 235 0EB	û	373 251 0FB
12	PLU	214 140 08C	ST	234 156 09C		254 172 0AC	¼	274 188 0BC	Ì	314 204 0CC	Ü	334 220 0DC	ì	354 236 0EC	ü	374 252 0FC
13	RI	215 141 08D	OSC	235 157 09D		255 173 0AD	½	275 189 0BD	Í	315 205 0CD	Ÿ	335 221 0DD	í	355 237 0ED	ÿ	375 253 0FD
14	SS2	216 142 08E	PM	236 158 09E	İ	256 174 0AE	ı	276 190 0BE	Î	316 206 0CE	Ş	336 222 0DE	î	356 238 0EE	ş	376 254 0FE
15	SS3	217 143 08F	APC	237 159 09F		257 175 0AF	¿	277 191 0BF	Ï	317 207 0CF	ß	337 223 0DF	ï	357 239 0EF		377 255 0FF

LEGEND

ESC	033 027 01B	Octal Decimal Hexadecimal

LJ–02466–RAGS

Figure 2–8 shows the Turkish ISO Latin-5 character set.

Figure 2–8 Turkish ISO Latin-5 Character Set

Row	Column 8	9	10	11	12	13	14	15
0	200 128 080	DCS 220 144 090	NBSP 240 160 0A0	° 260 176 0B0	À 300 192 0C0	Ğ 320 208 0D0	à 340 224 0E0	ğ 360 240 0F0
1	201 129 081	PU1 221 145 091	¡ 241 161 0A1	± 261 177 0B1	Á 301 193 0C1	Ñ 321 209 0D1	á 341 225 0E1	ñ 361 241 0F1
2	202 130 082	PU2 222 146 092	¢ 242 162 0A2	2 262 178 0B2	Â 302 194 0C2	Ò 322 210 0D2	â 342 226 0E2	ò 362 242 0F2
3	203 131 083	STS 223 147 093	£ 243 163 0A3	3 263 179 0B3	Ã 303 195 0C3	Ó 323 211 0D3	ã 343 227 0E3	ó 363 243 0F3
4	IND 204 132 084	CRH 224 148 094	¤ 244 164 0A4	’ 264 180 0B4	Ä 304 196 0C4	Ô 324 212 0D4	ä 344 228 0E4	ô 364 244 0F4
5	NEL 205 133 085	MW 225 149 095	¥ 245 165 0A5	µ 265 181 0B5	Å 305 197 0C5	Õ 325 213 0D5	å 345 229 0E5	õ 365 245 0F5
6	SSA 206 134 086	SPA 226 150 096	¦ 246 166 0A6	¶ 266 182 0B6	Æ 306 198 0C6	Ö 326 214 0D6	æ 346 230 0E6	ö 366 246 0F6
7	ESA 207 135 087	EPA 227 151 097	§ 247 167 0A7	· 267 183 0B7	Ç 307 199 0C7	× 327 215 0D7	ç 347 231 0E7	÷ 367 247 0F7
8	HTS 210 136 088	230 152 098	¨ 250 168 0A8	¸ 270 184 0B8	È 310 200 0C8	Ø 330 216 0D8	è 350 232 0E8	ø 370 248 0F8
9	HTJ 211 137 089	231 153 099	© 251 169 0A9	1 271 185 0B9	É 311 201 0C9	Ù 331 217 0D9	é 351 233 0E9	ù 371 249 0F9
10	VTS 212 138 08A	232 154 09A	a 252 170 0AA	o 272 186 0BA	Ê 312 202 0CA	Ú 332 218 0DA	ê 352 234 0EA	ú 372 250 0FA
11	PLD 213 139 08B	CSI 233 155 09B	« 253 171 0AB	» 273 187 0BB	Ë 313 203 0CB	Û 333 219 0DB	ë 353 235 0EB	û 373 251 0FB
12	PLU 214 140 08C	ST 234 156 09C	¬ 254 172 0AC	¼ 274 188 0BC	Ì 314 204 0CC	Ü 334 220 0DC	ì 354 236 0EC	ü 374 252 0FC
13	RI 215 141 08D	OSC 235 157 09D	SHY 255 173 0AD	½ 275 189 0BD	Í 315 205 0CD	İ 335 221 0DD	í 355 237 0ED	ı 375 253 0FD
14	SS2 216 142 08E	PM 236 158 09E	® 256 174 0AE	¾ 276 190 0BE	Î 316 206 0CE	Ş 336 222 0DE	î 356 238 0EE	ş 376 254 0FE
15	SS3 217 143 08F	APC 237 159 09F	¯ 257 175 0AF	¿ 277 191 0BF	Ï 317 207 0CF	ß 337 223 0DF	ï 357 239 0EF	ÿ 377 255 0FF

LEGEND

ESC	033 027 01B	Octal Decimal Hexadecimal

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Figure 2–9 shows the Turkish ISO Latin-5 CRM character set.

Figure 2–9 Turkish ISO Latin-5 CRM Character Set

Row	Column 8		9		10		11		12		13		14		15	
0	80	200 128 080	DCS	220 144 090	NBSP	240 160 0A0	°	260 176 0B0	À	300 192 0C0	Ğ	320 208 0D0	à	340 224 0E0	ğ	360 240 0F0
1	81	201 129 081	PU1	221 145 091	¡	241 161 0A1	±	261 177 0B1	Á	301 193 0C1	Ñ	321 209 0D1	á	341 225 0E1	ñ	361 241 0F1
2	82	202 130 082	PU2	222 146 092	¢	242 162 0A2	2	262 178 0B2	Â	302 194 0C2	Ò	322 210 0D2	â	342 226 0E2	ò	362 242 0F2
3	83	203 131 083	STS	223 147 093	£	243 163 0A3	3	263 179 0B3	Ã	303 195 0C3	Ó	323 211 0D3	ã	343 227 0E3	ó	363 243 0F3
4	IND	204 132 084	CRH	224 148 094	¤	244 164 0A4	’	264 180 0B4	Ä	304 196 0C4	Ô	324 212 0D4	ä	344 228 0E4	ô	364 244 0F4
5	NEL	205 133 085	MW	225 149 095	¥	245 165 0A5	µ	265 181 0B5	Å	305 197 0C5	Õ	325 213 0D5	å	345 229 0E5	õ	365 245 0F5
6	SSA	206 134 086	SPA	226 150 096	¦	246 166 0A6	¶	266 182 0B6	Æ	306 198 0C6	Ö	326 214 0D6	æ	346 230 0E6	ö	366 246 0F6
7	ESA	207 135 087	EPA	227 151 097	§	247 167 0A7	·	267 183 0B7	Ç	307 199 0C7	×	327 215 0D7	ç	347 231 0E7	÷	367 247 0F7
8	HTS	210 136 088	98	230 152 098	¨	250 168 0A8	¸	270 184 0B8	È	310 200 0C8	Ø	330 216 0D8	è	350 232 0E8	ø	370 248 0F8
9	HTJ	211 137 089	99	231 153 099	©	251 169 0A9	1	271 185 0B9	É	311 201 0C9	Ù	331 217 0D9	é	351 233 0E9	ù	371 249 0F9
10	VTS	212 138 08A	9A	232 154 09A	a	252 170 0AA	o	272 186 0BA	Ê	312 202 0CA	Ú	332 218 0DA	ê	352 234 0EA	ú	372 250 0FA
11	PLD	213 139 08B	CSI	233 155 09B	«	253 171 0AB	»	273 187 0BB	Ë	313 203 0CB	Û	333 219 0DB	ë	353 235 0EB	û	373 251 0FB
12	PLU	214 140 08C	ST	234 156 09C	¬	254 172 0AC	¼	274 188 0BC	Ì	314 204 0CC	Ü	334 220 0DC	ì	354 236 0EC	ü	374 252 0FC
13	RI	215 141 08D	OSC	235 157 09D	SHY	255 173 0AD	½	275 189 0BD	Í	315 205 0CD	İ	335 221 0DD	í	355 237 0ED	ı	375 253 0FD
14	SS2	216 142 08E	PM	236 158 09E	®	256 174 0AE	¾	276 190 0BE	Î	316 206 0CE	Ş	336 222 0DE	î	356 238 0EE	ş	376 254 0FE
15	SS3	217 143 08F	APC	237 159 09F	¯	257 175 0AF	¿	277 191 0BF	Ï	317 207 0CF	ß	337 223 0DF	ï	357 239 0EF	ÿ	377 255 0FF

LEGEND

ESC	033 (Octal) 027 (Decimal) 01B (Hexadecimal)

LJ–02468–RAGS

National Replacement Character Sets (NRCs)

Figure 2–10 shows the 7-bit Greek NRCs for VT mode only. Each NRC is a 7-bit character set with 94 graphic characters.

NOTE

Digital recommends that you operate the terminal in an 8-bit environment. The NRC sets are only provided for compatibility with 7-bit environments.

Figure 2–10 7-bit Greek NRCs (VT Mode Only)

Row	Column 0		1		2		3		4		5		6		7	
0	NU	000 000 000	DL	020 016 010		040 032 020	0	060 048 030	ϊ	100 064 040		120 080 050	ü	140 096 060		160 112 070
1	SH	001 001 001	D1	021 017 011	!	041 033 021	1	061 049 031	A	101 065 041	P	121 081 051	a	141 097 061	p	161 113 071
2	SX	002 002 002	D2	022 018 012	"	042 034 022	2	062 050 032	B	102 066 042	R	122 082 052	b	142 098 062	r	162 114 072
3	EX	003 003 003	D3	023 019 013	#	043 035 023	3	063 051 033	G	103 067 043	S	123 083 053	g	143 099 063	s	163 115 073
4	ET	004 004 004	D4	024 020 014	$	044 036 024	4	064 052 034	D	104 068 044	T	124 084 054	d	144 100 064	t	164 116 074
5	EQ	005 005 005	NK	025 021 015	%	045 037 025	5	065 053 035	E	105 069 045	U	125 085 055	e	145 101 065	u	165 117 075
6	AK	006 006 006	SY	026 022 016	&	046 038 026	6	066 054 036	Z	106 070 046	F	126 086 056	z	146 102 066	f	166 118 076
7	BL	007 007 007	EB	027 023 017	’	047 039 027	7	067 055 037	H	107 071 047	C	127 087 057	h	147 103 067	c	167 119 077
8	BS	010 008 008	CN	030 024 018	(	050 040 028	8	070 056 038	Q	110 072 048	Y	130 088 058	q	150 104 068	y	170 120 078
9	HT	011 009 009	EM	031 025 019	)	051 041 029	9	071 057 039	I	111 073 049	W	131 089 059	i	151 105 069	w	171 121 079
10	LF	012 010 00A	SB	032 026 01A	*	052 042 02A	:	072 058 03A	K	112 074 04A	á	132 090 05A	k	152 106 06A	V	172 122 07A
11	VT	013 011 00B	EC	033 027 01B	+	053 043 02B	;	073 059 03B	L	113 075 04B	é	133 091 05B	l	153 107 06B	ú	173 123 07B
12	FF	014 012 00C	FS	034 028 01C	,	054 044 02C	<	074 060 03C	M	114 076 04C	ή	134 092 05C	m	154 108 06C	ώ	174 124 07C
13	CR	015 013 00D	GS	035 029 01D	–	055 045 02D	=	075 061 03D	N	115 077 04D	í	135 093 05D	n	155 109 06D	´	175 125 07D
14	SO	016 014 00E	RS	036 030 01E	.	056 046 02E	>	076 062 03E	X	116 078 04E		136 094 05E	x	156 110 06E		176 126 07E
15	SI	017 015 00F	US	037 031 01F	/	057 047 02F	?	077 063 03F	O	117 079 04F	ó	137 095 05F	o	157 111 06F	DEL	177 127 07F

LEGEND

ESC	033 027 01B	Octal Decimal Hexadecimal

LJ–02455–RAGS

Figure 2–11 shows the 7-bit Hebrew NRCs in VT mode only.

Figure 2–11 7-bit Hebrew NRCs (VT Mode Only)

Row	Column 0	1	2	3	4	5	6	7
0	NU 000 000 000	DL 020 016 010	 040 032 020	0 060 048 030	@ 100 064 040	P 120 080 050	 140 096 060	 160 112 070
1	SH 001 001 001	D1 021 017 011	! 041 033 021	1 061 049 031	A 101 065 041	Q 121 081 051	 141 097 061	 161 113 071
2	SX 002 002 002	D2 022 018 012	" 042 034 022	2 062 050 032	B 102 066 042	R 122 082 052	 142 098 062	 162 114 072
3	EX 003 003 003	D3 023 019 013	# 043 035 023	3 063 051 033	C 103 067 043	S 123 083 053	 143 099 063	 163 115 073
4	ET 004 004 004	D4 024 020 014	$ 044 036 024	4 064 052 034	D 104 068 044	T 124 084 054	 144 100 064	 164 116 074
5	EQ 005 005 005	NK 025 021 015	% 045 037 025	5 065 053 035	E 105 069 045	U 125 085 055	 145 101 065	 165 117 075
6	AK 006 006 006	SY 026 022 016	& 046 038 026	6 066 054 036	F 106 070 046	V 126 086 056	 146 102 066	 166 118 076
7	BL 007 007 007	EB 027 023 017	' 047 039 027	7 067 055 037	G 107 071 047	W 127 087 057	 147 103 067	 167 119 077
8	BS 010 008 008	CN 030 024 018	(050 040 028	8 070 056 038	H 110 072 048	X 130 088 058	 150 104 068	 170 120 078
9	HT 011 009 009	EM 031 025 019	) 051 041 029	9 071 057 039	I 111 073 049	Y 131 089 059	 151 105 069	 171 121 079
10	LF 012 010 00A	SB 032 026 01A	* 052 042 02A	: 072 058 03A	J 112 074 04A	Z 132 090 05A	 152 106 06A	 172 122 07A
11	VT 013 011 00B	EC 033 027 01B	+ 053 043 02B	; 073 059 03B	K 113 075 04B	[133 091 05B	 153 107 06B	 173 123 07B
12	FF 014 012 00C	FS 034 028 01C	, 054 044 02C	< 074 060 03C	L 114 076 04C	\ 134 092 05C	 154 108 06C	 174 124 07C
13	CR 015 013 00D	GS 035 029 01D	– 055 045 02D	= 075 061 03D	M 115 077 04D	] 135 093 05D	 155 109 06D	 175 125 07D
14	SO 016 014 00E	RS 036 030 01E	. 056 046 02E	> 076 062 03E	N 116 078 04E	^ 136 094 05E	 156 110 06E	 176 126 07E
15	SI 017 015 00F	US 037 031 01F	/ 057 047 02F	? 077 063 03F	O 117 079 04F	_ 137 095 05F	 157 111 06F	 177 127 07F

LEGEND

ESC	033 027 01B

Octal
Decimal
Hexadecimal

LJ–02460–RAGS

Figure 2–12 shows the 7-bit Turkish NRCs in VT mode only.

Figure 2–12 7-bit Turkish NRCs (VT Mode Only)

Column	0		1		2		3		4		5		6		7	
Row 0	NU	000 000 000	DL	020 016 010		040 032 020	0	060 048 030	İ	100 064 040	P	120 080 050	Ğ	140 096 060	p	160 112 070
1	SH	001 001 001	D1	021 017 011	ı	041 033 021	1	061 049 031	A	101 065 041	Q	121 081 051	a	141 097 061	q	161 113 071
2	SX	002 002 002	D2	022 018 012	"	042 034 022	2	062 050 032	B	102 066 042	R	122 082 052	b	142 098 062	r	162 114 072
3	EX	003 003 003	D3	023 019 013	#	043 035 023	3	063 051 033	C	103 067 043	S	123 083 053	c	143 099 063	s	163 115 073
4	ET	004 004 004	D4	024 020 014	$	044 036 024	4	064 052 034	D	104 068 044	T	124 084 054	d	144 100 064	t	164 116 074
5	EQ	005 005 005	NK	025 021 015	%	045 037 025	5	065 053 035	E	105 069 045	U	125 085 055	e	145 101 065	u	005 117 075
6	AK	006 006 006	SY	026 022 016	ğ	046 038 026	6	066 054 036	F	106 070 046	V	126 086 056	f	146 102 066	v	166 118 076
7	BL	007 007 007	EB	027 023 017	’	047 039 027	7	067 055 037	G	107 071 047	W	127 087 057	g	147 103 067	w	167 119 077
8	BS	010 008 008	CN	030 024 018	(	050 040 028	8	070 056 038	H	110 072 048	X	130 088 058	h	150 104 068	x	170 120 078
9	HT	011 009 009	EM	031 025 019	)	051 041 029	9	071 057 039	I	111 073 049	Y	131 089 059	i	151 105 069	y	171 121 079
10	LF	012 010 00A		032 026 01A	*	052 042 02A	:	072 058 03A	J	112 074 04A	Z	132 090 05A	j	152 106 06A	z	172 122 07A
11	VT	013 011 00B	EC	033 027 01B	+	053 043 02B	;	073 059 03B	K	113 075 04B	Ş	133 091 05B	k	153 107 06B	ş	173 123 07B
12	FF	014 012 00C	FS	034 028 01C	,	054 044 02C	<	074 060 03C	L	114 076 04C	Ö	134 092 05C	l	154 108 06C	ö	174 124 07C
13	CR	015 013 00D	GR	035 029 01D	–	055 045 02D	=	075 061 03D	M	115 077 04D	Ç	135 093 05D	m	155 109 06D	ç	175 125 07D
14	SO	016 014 00E	RS	036 030 01E	.	056 046 02E	>	076 062 03E	N	116 078 04E	Ü	136 094 05E	n	156 110 06E	ü	176 126 07E
15	SI	017 015 00F	US	037 031 01F	/	057 047 02F	?	077 063 03F	O	117 079 04F	_	137 095 05F	o	157 111 06F		177 127 07F

LEGEND

ESC	033 027 01B

Octal
Decimal
Hexadecimal

LJ–02465–RAGS

Part 2
Control Functions Sent to the Host

3

Keyboard Codes

This chapter describes the keyboards and the additional codes that the terminal can send to an application program. The chapter assumes that you are familiar with the character-encoding concepts described in the *VT420 Video Terminal Programmer Reference Manual*.

The worldwide model of the terminal can use several additional keyboard dialects. The new keyboard dialects are `French/Canadian`, `Greek/N-A`, `Hebrew/N-A`, `Turkish-F`, and `Turkish-Q`. You can select the appropriate dialect by setting the **keyboard language** feature in the Set-Up Directory. This chapter describes the significant differences among the new keyboards.

Keyboard Layouts

This section shows only the main keypads for the Greek, Hebrew, and Turkish ANSI keyboards. The editing keypad, numeric keypad, and top-row function keys on these keyboards are identical to the ANSI keyboard layout described in the *VT420 Video Terminal Programmer Reference Manual*. See Chapter 9 for a description of the PC keyboards.

The French/Canadian ANSI keyboard exists with previous versions of the terminal.

Figure 3–1 shows the Greek/N-A ANSI keyboard.

Figure 3–1 Greek/N-A ANSI Keyboard

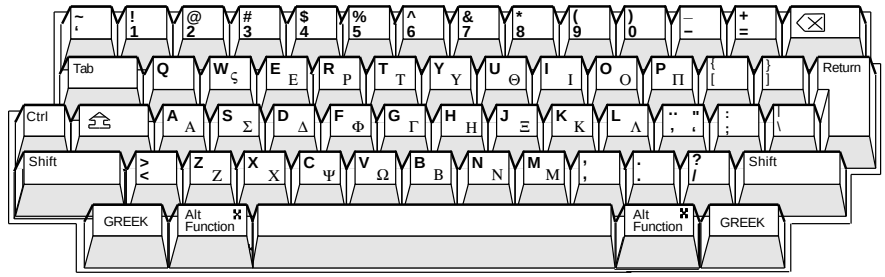


Figure 3–2 shows the Hebrew/N-A ANSI keyboard.

Figure 3–2 Hebrew/N-A ANSI Keyboard

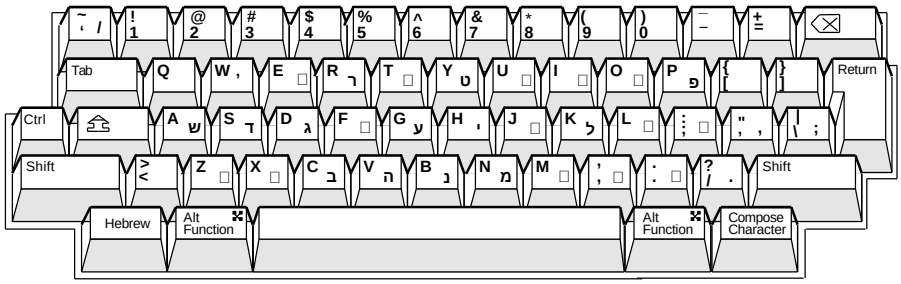


Figure 3–3 shows the Turkish-F ANSI keyboard.

Figure 3–3 Turkish-F ANSI Keyboard

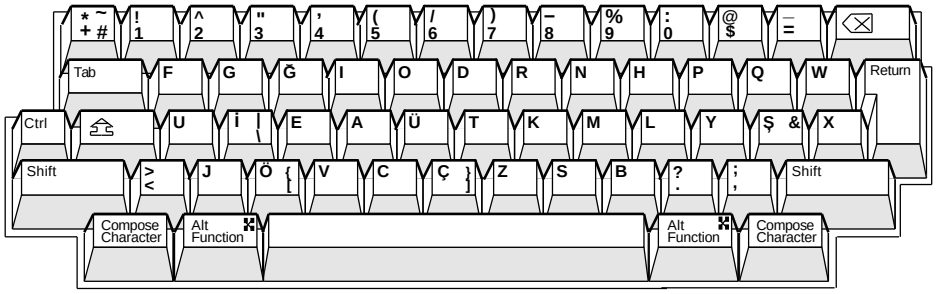
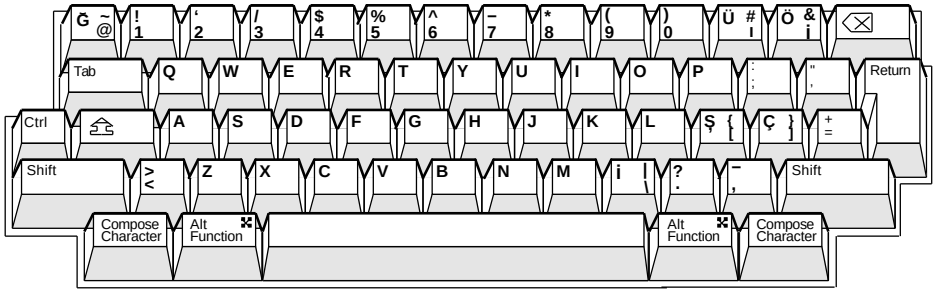


Figure 3–4 shows the Turkish-Q ANSI keyboard.

Figure 3–4 Turkish-Q ANSI Keyboard



Special-Function Keys (ANSI Keyboard)

The following describes only the unique function keys on the additional ANSI main keypads.

On Greek keyboard

GREEK	You use this key to change the keyboard mapping between Greek and North American.

On Hebrew keyboard

Ctrl Hebrew	You use this key sequence to change the keyboard mapping between Hebrew and North American.
Hebrew	This key acts the same as the Compose Character key on other ANSI keyboards. It does not send a code. Pressing the key starts a compose sequence. You can use compose sequences to create characters that do not appear on any single key (such as characters from Hebrew 8-bit supplemental character set). You can disable the key in set-up. See the description of the Compose key in the "Keyboard Set-Up Screen" section of the *Installing and Using the VT420 Video Terminal With PC Terminal Mode Update.*

Part 3
Control Functions Received from the Host

4

Emulating VT Series Terminals

The VT420 terminal can operate like Digital's VT400, VT300, VT200, and VT100 series text terminals. The additional features affect all levels of operation.

Level 1 (VT100 Mode)

VT100 mode supports the Greek, Hebrew, and Turkish functionality under the following conditions:

- To use the Greek functionality, you must select the `Greek/N-A` keyboard dialect in the Set-Up Directory screen and `VT100 Mode` in the General Set-Up screen.
- To use the Hebrew functionality, you must select the `Hebrew/N-A` keyboard dialect in the Set-Up Directory screen and `VT100 Mode` in the General Set-Up screen.
- To use the Turkish functionality, you must select the `Turkish-F` or `Turkish-Q` keyboard dialect in the Set-Up Directory screen and `VT100 Mode` in the General Set-Up screen.
- When you select the Hebrew/N-A keyboard dialect, the terminal uses the following escape sequences:

  Entering Hebrew and using the escape sequence displays the following information:

  `ESC ) 1`

  DECRLM set
  DECHEBM set
  DECHEM reset

Exiting Hebrew and using the escape sequence displays the following information:

```
ESC ) B
```

DECRLM reset
ASCII is designated into G1

Level 4 (VT400 Mode)

VT400 mode supports the Greek, Hebrew, and Turkish functionality under the following conditions:

- When you select the `Greek/N-A` keyboard dialect, the terminal uses the character sets described for previous revisions and the Greek character sets.
- When you select the `Hebrew/N-A` keyboard dialect, the terminal uses the character sets described for previous revisions and the Hebrew character sets.
- When you select the `Turkish-F` or `Turkish-Q` keyboard dialect, the terminal uses the character sets described for previous revisions and the Turkish character sets.

All Levels

You can enable the Hebrew encoding mode (DECHEM) at any operating level.

Hebrew Encoding Mode (DECHEM)

This control function sets the terminal's character set mode to DEC (8-bit) multinational mode. On a reset, the sequence resets the terminal's character set mode to (7-bit) national mode (NRC sets).

The terminal maintains DECHEM for the main display and status line separately in the same way as it maintains National Replacement Character Set Mode (DECNRCM).

Format

CSI	**?**	**3**	**6**	**h**	– Set
9/11	3/15	3/3	3/6	6/8	

Format

CSI	**?**	**3**	**6**	**l**	– Reset
9/11	3/15	3/3	3/6	6/12	

5

Using Character Sets

This chapter describes how you can select the French/Canadian, Greek, Hebrew, and Turkish character sets to use with your terminal in VT mode. This chapter assumes you are familiar with the character-encoding concepts described in the *VT420 Video Terminal Programmer Reference Manual*.

The terminal has additional hard character sets. Table 5–1 lists the hard character sets you can select at each operating level.

Table 5–1 Additional Character Sets Available

Character Sets	Level 1 (VT100 Mode)	Level 4 (VT400 Mode)
8-bit Greek Supplemental	No	All character sets are available.
8-bit Hebrew Supplemental	No	
8-bit Turkish Supplemental	No	
(Greek) ISO Latin-7	No	
(Greek) ISO Latin-7 CRM	No	
ISO Latin-Hebrew	No	
ISO Latin-Hebrew CRM	No	
(Turkish) ISO Latin-5	No	
(Turkish) ISO Latin-5 CRM	No	
7-bit Greek NRCs*	Yes	
7-bit Hebrew NRCs*	Yes	
7-bit Turkish NRCs*	Yes	
7-bit French/Canadian NRCs*	Yes	

*Worldwide PC TERM model only.

Selecting Character Sets

The *VT420 Video Terminal Programmer Reference Manual* explains how to select character sets. The following sections describe the control functions you use to designate and map the additional character sets.

Designating Character Sets (SCS Sequences)

You designate a hard character set as G0 through G3 by using a select character set (SCS) escape sequence as shown in Table 5–2. You cannot designate a 96-character set as G0.

SCS sequences use the following format. Table 5–3 lists the code used to select each available character set.

NOTE

The ISO Latin supplemental character sets are the only 96-character hard sets available in the terminal. All other hard sets have 94 characters.

Format

ESC	I_1	I_2	···	I_n	F
1/11	***	***	...	***	***

Parameters

I_1, intermediate character

Designates the character set as G0, G1, G2, or G3.

Table 5–2 Designating a Character Set

I_1 Character		Code	Set Selection
94-Character Sets			
(	left parenthesis	2/8	G0 (initial setting for GL)
)	right parenthesis	2/9	G1
*	asterisk	2/10	G2 (initial setting for GR)
+	plus sign	2/11	G3
96-Character Sets*			
-	hyphen	2/13	G1
.	period	2/14	G2
/	slash	2/15	G3

*You cannot designate a 96-character set into G0.

$I_2...I_n$ F, intermediate and final characters

Selects one of the standard character sets. Table 5–3 lists the characters used to select standard sets.

Table 5–3 Character Set Codes

Character Set	$I_2...I_n$ F Characters	Code
94-Character Sets		
ASCII (initial setting for G1 and G0)	**B**	**4/2**
DEC Supplemental Graphic (initial setting for G2 and G3)	**% 5**	**2/5, 3/5**
DEC Greek Supplemental Graphic	**" ?**	**2/2, 3/15**
DEC Hebrew Supplemental Graphic	**" 4**	**2/2, 3/4**
DEC Turkish Supplemental Graphic	**% 0**	**2/5, 3/0**
DEC Special Graphics	0	3/0
DEC Technical	>	3/14
User-preferred supplemental	<	3/12
NRC Sets*		
DEC Greek 7-bit	" >	2/2 3/14
DEC Hebrew 7-bit	% =	2/5, 3/13
DEC Turkish 7-bit	% 2	2/5, 3/2
96-Character Sets		
ISO Latin–7 (Greek)	F	4/6
ISO Latin–Hebrew	H	4/8
ISO Latin–5 (Turkish)	M	4/13

*Only one national character set is available at a time. You must select national mode to use national character sets. See "National Replacement Character Sets (Worldwide Model Only)" in this section.

Examples

The following sequence designates the DEC Hebrew supplemental character set as the G1 logical set:

```
ESC ) " 4
```

The following sequence designates the ISO Latin–7 (Greek) supplemental character set as the G3 logical set:

```
ESC / F
```

National Replacement Character Sets (Worldwide Model Only)

The terminal has several 7-bit character sets for different national languages (Chapter 2). Only one national replacement character set is available at a time.

To use a national replacement character set, you must select national replacement character set mode. When you reset this mode, the terminal uses 7-bit and 8-bit characters from one of the multinational character sets. The multinational character set may be either one of the following 8-bit supplemental character sets or one of the 7-bit ISO Latin character sets:

8-bit Supplemental

- DEC Supplemental
- DEC Greek 8-bit Supplemental
- DEC Hebrew 8-bit Supplemental
- DEC Turkish 8-bit Supplemental

7-bit ISO Latin

- ISO Latin-1
- ISO Latin-7 (Greek)
- ISO Latin-Hebrew
- ISO Latin-5 (Turkish)

When you set this mode, the terminal uses 7-bit characters from an NRC set. See the *VT420 Video Terminal Programmer Reference Manual* for more information.

Assigning User-Preferred Supplemental Sets (DECAUPSS)

You can assign the supplemental character set you use most often as a special standby set. This standby set is called the user-preferred supplemental set. This feature provides applications with an easy way to access the user's preferred supplemental set.

Default: DEC Supplemental Graphic

Format

DCS	**0**	**!**	**u**	**%**	**5**	**ST**	DEC Supplemental
9/0	3/0	2/1	7/5	2/5	3/5	9/12	Graphic set.
DCS	**0**	**!**	**u**	**"**	**?**	**ST**	DEC Greek 8-bit
9/0	3/0	2/1	7/5	2/2	3/15	9/12	Supplemental set.
DCS	**0**	**!**	**u**	**"**	**4**	**ST**	DEC Hebrew 8-bit
9/0	3/0	2/1	7/5	2/2	3/4	9/12	Supplemental set.
DCS	**0**	**!**	**u**	**%**	**0**	**ST**	DEC Turkish 8-bit
9/0	3/0	2/1	7/5	2/5	3/0	9/12	Supplemental set.
DCS	**0**	**!**	**u**	**A**	**ST**	ISO Latin-1 set.	
9/0	3/0	2/1	7/5	4/1	9/12		
DCS	**1**	**!**	**u**	**F**	**ST**	ISO Latin-7 (Greek) set.	
9/0	3/1	2/1	7/5	4/6	9/12		
DCS	**1**	**!**	**u**	**H**	**ST**	ISO Latin-Hebrew set.	
9/0	3/1	2/1	7/5	4/8	9/12		
DCS	**1**	**!**	**u**	**M**	**ST**	ISO Latin-5 (Turkish) set.	
9/0	3/1	2/1	7/5	4/13	9/12		

Description

You can assign any supplemental or ISO Latin supplemental set as the standby set. After you assign a set, you must designate and map the set before using it.

1. Designate the set as G1, G2, or G3.
2. Map the set into GR.

For more information on designating and mapping sets, see the *VT420 Video Terminal Programmer Reference Manual*.

6

Cursor Movement and Panning

This chapter describes the additional control functions you can use to move the cursor. It also includes a correction to the page cursor-coupling mode (DECPCCM) control sequence.

Moving the Cursor on the Current Page

This section describes the **Cursor Direction** function, which enables the terminal to move the cursor from `Right to Left` or `Left to Right` on the current page.

Cursor Addressing

The **Cursor Direction** function (`Right to Left` and `Left to Right`) does not affect cursor addressing. The cursor position (1,1) (line 1, column 1) is always in the upper left corner of the screen. The last column of an 80 or 132 column display is always at the right side of the screen.

Also, the **Cursor Direction** function does not affect the following functions:

Cursor movement:

- Tab
- Margin Bell
- Cursor Position (CUP)
- Horizontal and Vertical Position (HVP)

- Cursor Forward (CUF)
- Cursor Backward (CUB)

Character insertion, protection and erase:

- Insert Character (ICH)
- Delete Character (DCH)
- Erase in Display (ED)
- Erase in Line (EL)
- Selective Erase in Display (DECSED)
- Selective Erase in Line (DECSEL)
- Erase Character (ECH)
- Delete Column (DECDC)
- Insert Column (DECIC)

Right to Left Cursor Direction

The **Cursor Direction** function does affect the following functions:

- Insert/Replace Mode (IRM)

  When the terminal is set to *Insert Mode*, the firmware shifts all characters one position to the left from the current cursor position to the left margin.

- Auto-wrap Mode (DECAWM)

  When the terminal enables Auto-wrap, the characters automatically wrap to the right border of the next line when the cursor reaches the left border of a page in page memory.

- Backspace (BS)

  When the terminal receives a BS, the cursor moves one position to the right.

- Line feed (LF), Vertical tab (VT), and Form feed (FF)

  When the terminal receives a LF, VT, and FF and sets *New Line Mode*, the cursor moves to the right margin on the next line.

- Carriage return (CR)

  When the terminal receives a CR, the cursor moves to the right-most column on the current line.

- New Line (NEL)

  When the terminal receives a NEL, the cursor moves to the right-most column on the next line.

- Substitute character (SUB)

  When the terminal receives a SUB, it performs a number of operations described in the *VT420 Video Terminal Programmer Reference Manual*. The firmware positions the displayed error character according to the current **Cursor Direction** setting.

Cursor Right to Left Mode (DECRLM)

This control function starts/stops the right to left cursor direction. DECRLM state is common to both the main display and the status line display. The status line is effected only when you set it to `Host Writable Status Display` in the Display Set-Up screen.

Format

CSI	**?**	**3**	**4**	**h**	– Set
9/11	3/15	3/3	4/4	6/8	

Format

CSI	**?**	**3**	**4**	**l**	– Reset
9/11	3/15	3/3	4/4	6/12	

Cursor Coupling

This section provides a correction to the **Page Cursor-Coupling** function.

Page Cursor-Coupling Mode (DECPCCM)

This control function determines if a new page appears in the display when the cursor moves to a new page. DECPCCM is only useful with a multiple-page format, which is described in Chapter 6 of the *VT420 Video Terminal Programmer Reference Manual*.

Format

CSI	?	6	4	h	– Set: couples the cursor to the display.
9/11	3/15	3/6	4/4	6/8	

Format

CSI	?	6	4	l	– Reset: uncouples the cursor.
9/11	3/15	3/6	4/4	6/12	

Description

When DECPCCM is set, the cursor is coupled to the display when the cursor moves to a new page. The new page appears in the display to keep the cursor in view.

When DECPCCM is reset, the cursor is uncoupled from the display. If the cursor moves to a new page, then the cursor disappears.

Summary

Table 6–1 lists all the control functions that affect cursor movement and panning.

Table 6–1 Cursor Movement and Panning Sequences

Name	Mnemonic	Sequence
Enabling the Cursor		
Text cursor enable mode	DECTCEM	Set: **CSI ? 25 h** Visible cursor. (D) Reset: **CSI ? 25 l** Invisible cursor.
Moving the Cursor*		
Back index†	DECBI	**ESC 6**
Forward index†	DECFI	**ESC 9**
Cursor position	CUP	**CSI** *Pl* **;** *Pc* **H** Line *Pl*, column *Pc*.
Horizontal and vertical position	HVP	**CSI** *Pl* **;** *Pc* **f** Line *Pl*, column *Pc*. (Digital recommends using CUP instead.)
Cursor forward	CUF	**CSI** *Pn* **C** *Pn* columns to the right.
Cursor backward	CUB	**CSI** *Pn* **D** *Pn* columns to the left.
Cursor up	CUU	**CSI** *Pn* **A** *Pn* lines up.
Cursor down	CUD	**CSI** *Pn* **B** *Pn* lines down.

*In these sequences, the default value for *Pn*, *Pl*, and *Pc* is 1.

†Available in VT400 mode only.

(D) = default.

Table 6–1 (Continued) Cursor Movement and Panning Sequences

Name	Mnemonic	Sequence
Moving the Cursor*		
Cursor right to left	DECRLM	Set: **CSI ? 34 h** Cursor moves from right to left. Reset: **CSI ? 34 l** Cursor moves from left to right.
Panning*		
Pan down	SU	**CSI** *Pn* **S** *Pn* lines down.
Pan up	SD	**CSI** *Pn* **T** *Pn* lines up.
Vertical cursor-coupling mode	DECVCCM	Set: **CSI ? 61 h** Coupled. (D) Reset: **CSI ? 61 l** Uncoupled.
Page cursor-coupling mode	DECPCCM	Set: **CSI ? 64 h** Coupled. (D) Reset: **CSI ? 64 l** Uncoupled.

*In these sequences, the default value for *Pn*, *Pl*, and *Pc* is 1.

(D) = default.

7

Keyboard Commands

This chapter describes the added control functions for the following areas:

- Keyboard keys
- Screen displays including the status line

Keyboard Control Functions

This section describes the control functions that affect the mapping of the Greek/N-A and Hebrew/N-A keyboards.

Greek/N-A Keyboard Mapping (DECNAKB)

This control function sets the keyboard mapping to `North American` and resets the mapping to `Greek/N-A`.

Format

CSI	**?**	**5**	**7**	**h**	– Set
9/11	3/15	3/5	3/7	6/8	

Format

CSI	**?**	**5**	**7**	**l**	– Reset
9/11	3/15	3/5	3/7	6/12	

Hebrew/N-A Keyboard Mapping (DECHEBM)

This control function sets the keyboard mapping to `Hebrew/N-A` and resets the mapping to `North American`.

Format

CSI	**?**	**3**	**5**	**h**	– Set
9/11	3/15	3/3	3/5	6/8	

Format

CSI	**?**	**3**	**5**	**l**	– Reset
9/11	3/15	3/3	3/5	6/12	

User-Defined Keys (DECUDK)

This section replaces the User-Defined Keys (DECUDK) section in Chapter 11, "Keyboard, Printing, and Display Commands," of the *VT420 Video Terminal Programmer Reference Manual*. This section describes the UDKs for the VT420 models without PC TERM mode. See Chapter 9 for a description of the UDKs for the keyboards used with the VT420 with PC TERM mode.

The keyboard has 20 function keys on its top row. You can define the codes sent by the following keys with some exceptions:

F6 to F14, Do, Help, and F17 to F20

The following five keys on the ANSI keyboards—F1 (Hold), F2 (Print), F3 (Set-Up), F4 (Session), and F5 (Break)—have dedicated local functions. You can change the function of keys F1 to F4 on the ANSI keyboards by using the local key control (DECLFKC) function. Applications cannot disable the F5 (Break) key.

Using UDKs

User-defined keys (UDKs) are only available in VT400 mode. UDKs do not work in VT100 and VT52 modes.

You define the function of keys by using a DECUDK device control string, as described in the Programming UDKs section that follows. After you define a key, you can use the new function by pressing:

Shift *key*

where *key* is the key you defined. This chapter describes how to program the keys by using a DECUDK device control string.

UDK Memory Space

There are 256 bytes of memory available for the 15 user-defined keys. Space is supplied on a first-come/first-serve basis. When the 256 bytes are full, you cannot define any more keys until you clear some of the memory space. There are three ways you can clear space:

- Redefine one or more UDKs, with a DECUDK control string.
- Clear one or more UDKs, with a DECUDK control string.
- Clear all UDKs, with a terminal power-up or reset (RIS) operation.

Programming UDKs

You use the following device control string format to download definitions for user-defined keys. See the *VT420 Video Terminal Programmer Reference Manual* for general information about device control strings.

Available in: VT400 mode only.

Format

DCS	**Pc ; Pl**	**|**	**Ky1/St1;...Kyn/Stn**	**ST**
Device Control String Introducer	Clear and Lock Parameters	Final Character	Key Definition String	String Terminator

Parameters

DCS (9/0)
indicates the beginning of a device control string. DCS is an 8-bit C1 character. You can use ESC P (1/11 5/0) for a 7-bit environment.

Pc
is the *clear parameter*. *Pc* selects how to clear key definitions.

Pc	**Action**
0 (default) or none	Clear all keys before loading new values.
1	Clear one key at a time, before loading a new value.

When *Pc* is 1, the terminal only clears the keys you are loading. By using a *Pc* value of 1, you can redefine some keys without redefining them all.

NOTE

There are 256 bytes of memory for all user-defined keys. A key definition can only use the number of bytes available when that key is loaded.

Programming Tip

If *Pc* is 1, a key load may fail because no memory space is available. The reason for this is as follows.

With *Pc* set to 1, keys are cleared and loaded sequentially. If the new definition for a key is larger than the old one, you may exceed the 256 byte limit.

For example, suppose F6 contains 120 bytes, F7 contains 110 bytes, and F8 contains 20 bytes. You try to load F8 with 40 bytes, F6 with 1 byte, and F7 with 1 byte, in that order. This works if all keys are cleared first (*Pc* is 0), but not if keys are cleared one at a time (*Pc* is 1). When you try to load F8 with 40 bytes, the load fails because only 26 bytes are free at that time.

256 (maximum) – 120 (F6) – 110 (F7) = 26

Pl
is the *lock parameter*. *Pl* determines whether the key definitions are locked or unlocked after you load them.

Pl	Action
0 or none	Lock the keys. If you want to load new values into the keys, you must unlock the keys by using set-up.
1	Do not lock the keys. The keys are unlocked and can be redefined with another DECUDK string.

If *Pl* is 1 and the keys are already locked, then nothing happens.

The terminal uses a special lock to prevent or allow the programming of user-defined keys. You can turn on this lock from set-up or from the host (with a DECUDK device control string). The lock affects all programmable keys. When you use the lock, you should follow these guidelines:

- **Unlock the keys to define them.**

  The keys must be unlocked before you can define them. You can only unlock the keys from set-up. If a key is locked and an application tries to redefine the key with a DECUDK sequence, then the terminal ignores the sequence.

- **Lock the keys to prevent redefinition.**

  You can lock the keys from set-up or from the host (by sending a DECUDK sequence). New key definitions are locked by default.

|

is the *final character*. The vertical bar (7/12) identifies this control string as a DECUDK.

Ky1/St1;...Kyn/Stn

are the *key definition strings*. You include these strings between the final character (|) and the string terminator (ST). Each string consists of a key selector number (*Kyn*) and a string parameter (*Stn*), separated by a slash (/, 2/15). A semicolon (3/11) separates different strings.

- The key selector number (**Kyn**) indicates which key you are defining. The following is a list of definable keys and their identifying values.

Key	Value	Key	Value	Key	Value
F6	17	F11	23	Do	29
F7	18	F12	24	F17	31
F8	19	F13	25	F18	32
FF9	20	F14	26	F19	33
F10	21	Help	28	F20	34

- The string parameters (**Stn**) are the encoded definition of the keys. String parameters consist of hex pairs in the following ranges:

  3/0 through 3/9 (0 through 9)
  4/1 through 4/6 (A through F)
  6/1 through 6/6 (a through f)

  When you combine these hex values, they represent an 8-bit quantity. The ASCII table in Chapter 2 lists the hex values of characters.

  This method lets you use any of the 256 character codes in the key string. You can enter key definition strings in any order.

  Default: Empty. The key is undefined.

ST

is the *string terminator*. ST (9/12) is a C1 8-bit character. You can use ESC \ (1/11, 5/12) for a 7-bit environment.

Notes On Loading UDKs

Here are some general guidelines you should keep in mind when loading UDKs.

- **Clear UDK memory space before loading new definitions.**

  Use a DECUDK string to clear keys without locking them. Then you can use another DECUDK string to redefine the keys and lock them.

- **If you redefine a key, the old definition is lost.**

  This may clear some space if the new definition uses less bytes than the old one.

- **There is only one way to unlock UDKs.**

  To unlock UDKs, you must use the General Set-Up screen.

- **The value for each key definition is empty.**

  When you clear UDKs, they are empty.

- **An invalid hex pair in a DECUDK string stops a UDK load sequence.**

  When a load sequence stops (due to error or other cause), the terminal saves any keys already loaded and sends the rest of the DECUDK sequence to the screen.

Examples of DECUDK Device Control Strings

The following sequence clears unshifted UDKs:

```
DCS 0 ; 1 ; 1 | ST
```

The following sequence locks unshifted UDKs:

```
DCS 1 ; 0 ; 1 | ST
```

Suppose you want to define the unshifted F20 key to be "PRINT", without clearing or locking any other keys. The first part of your sequence would look like this:

```
DCS 1 ; 1 ; 1 | 3 4 /
```

34 is the code for the F20 key.

After the slash character (/, 2/15), you include the definition. The rest of the sequence after the slash character would look like this:

```
5 0 5 2 4 9 4 E 5 4 ST
```

The hex encoding for “PRINT” is as follows:

50 = P

52 = R

49 = I

4E = N

54 = T

The ST character (9/12) marks the end of the control string.

The complete string is as follows:

```
DCS 1 ; 1 ; 1 | 34 / 50 52 49 4E 54 ST
```

8

VT420 Reports

The VT420 terminal sends reports in response to requests from the host system. The additional reports provide the host with the following information:

- Keyboard Device Status Report (DSR)
- Keyboard dialect
- Keyboard mapping
- Cursor state
- User-preferred supplemental character set
- Terminal state

Device Status Report (DSR)

The host computer and terminal exchange DSR sequences to provide the host with the operating status of many features. This update provides the status of the keyboard dialect.

DSR requests and reports follow one of two formats, ANSI standard or DEC private. All of the additional reports use the following DEC private format:

DEC private	**CSI**	**?**	*Ps*	**n**
	9/11	3/15	3/?	6/14

Ps indicates the type of DSR requested.

The only effect to the DSR requests are additional keyboard dialects. Refer to the *VT420 Video Terminal Programmer Reference Manual* for a description of all the DSR requests.

DSR—Keyboard Status

The host asks for the current keyboard dialect, operating status, and type. This section provides a complete list of keyboards, including the additional keyboard dialects.

Exchange	Sequence	Meaning
Request (Host to VT420)	**CSI ? 26 n**	The host asks for the keyboard status.
Response (VT420 to host)	**CSI ? 27;** *Pn; Pst; Ptyp* **n**	The keyboard dialect is *Pn*, the keyboard status is *Pst*, and the keyboard type is *Ptyp*.

	Dialect			
Pn	**ANSI**	**PC**	**Pst**	**Keyboard Status***
0	Unknown	Unknown	0	Keyboard ready.
1	North American†	North American†		The terminal
2	British	British		sends typed
3	Flemish	Belgian		characters to the
4	Canadian (French)	Canadian (French)		current session
5	Danish	Danish		(Chapter 14).‡
6	Finnish	Finnish		
7	German	German	3	No keyboard.
8	Dutch	—		The terminal
9	Italian	Italian		does not detect
10	Swiss (French)	Swiss (French)		the keyboard.
11	Swiss (German)	Swiss (German)		
12	Swedish	Swedish	8	Keyboard busy.
13	Norwegian	Norwegian		The other
14	French/Belgian	French		session is
15	Spanish Int.	Spanish Int.		currently using
16	Portuguese	Portuguese		the keyboard
19	Hebrew/N-A	Hebrew/N-A		(Chapter 14).‡
22	Greek/N-A	Greek/N-A		
28	Canadian (English)	—		
29	Turkish-Q	Turkish		
30	Turkish-F	—		
32	—	Spanish Natl.		

Ptyp	**Keyboard Type**
0	LK201/LK301
1	LK401
2	LK443/LK444
3	LK421

*The terminal only sends *Pst* in VT400 mode.

†The terminal does not transmit Unknown. Unknown is for devices that cannot determine the keyboard type.

‡Chapter 14, "Session Management," *VT420 Video Terminal Programmer Reference Manual*

Terminal State Reports (VT400 Mode Only)

The host can request the terminal's current operating state. In response to this request, the terminal returns a terminal state report. The host can use the information in the report to save the current terminal state. Later, the host can restore the terminal to the saved state.

This operation is useful for applications that need to temporarily change the terminal's operating state. When the application is finished, it can restore the terminal to the previous operating state.

A terminal state report is a device control string. The report indicates the settings of most of the terminal's features. The terminal sends the report in response to a request terminal state report (DECRQTSR) sequence from the host.

This update extends DECRQTSR and DECRSTS to support the Greek, Hebrew, and Turkish functionality, for example, the character sets, their designators, and the keyboard dialect. Refer to Chapter 12, "VT420 Reports," in the *VT420 Video Terminal Programmer Reference Manual* for more details.

Terminal State Report (DECTSR)—VT420 to Host

The terminal sends this sequence in response to a request terminal state report (DECRQTSR) sequence. DECTSR informs the host of the entire state of the terminal, except for user-defined key definitions and the current soft character set.

Restore Terminal State (DECRSTS)—VT400 Mode Only

This sequence restores the terminal to a previous state specified in a terminal state report (DECTSR).

Presentation State Reports (VT400 Mode Only)

The terminal can send two presentation state reports.

Cursor information report (DECCIR)	Reports on the cursor position, including its visual attributes. Also reports on origin mode (DECOM), and the current active character sets.
Tab stop report (DECTABSR)	Reports the current tab stop settings.

The host can request the terminal's current presentation state. In response to this request, the terminal returns a presentation state report. The host can use the information in the report to save the current presentation state. Later, the host can restore the terminal to the saved state.

This operation is useful for applications that need to temporarily change the terminal's presentation state. When the application is finished, it can restore the terminal to the previous presentation state.

A presentation state report is a device control string. The terminal sends the report in response to a request presentation state report (DECRQPSR) sequence from the host.

This update enables the DECRSPS and DECCIR sequences to accept the designators of the French/Canadian, Greek, Hebrew, and Turkish character sets (Chapter 2) as assignments to one of the G0, G1, G2, or G3 logical character sets. See the *VT420 Video Terminal Programmer Reference Manual* for more details.

Cursor Information Report (DECCIR)—VT420 to Host

The terminal sends this sequence in response to a request presentation state report (DECRQPSR) sequence. DECCIR reports the status of the cursor position, including visual attributes and character protection attributes. DECCIR also reports the status of origin mode (DECOM) and the current active character sets.

Restore Presentation State (DECRSPS)—VT400 Mode Only

This control function restores the terminal to a previous state based on one of the presentation state reports. There are two presentation state reports.

Cursor information report (DECCIR)
Tab stop report (DECTABSR)

A DECRSPS sequence can only restore the information from one report at a time, cursor information, or tab stop.

Mode Settings (VT400 Mode Only)

The host can request the current settings of any ANSI or DEC private modes. In response to this request, the terminal returns a report indicating which modes are set and which are reset. The host can use the information in the report to save the current mode settings. Later, the host can restore the mode settings to their saved state.

This operation is useful for applications that need to temporarily change a number of modes. When the application is finished, it can restore the modes to their previous state.

The host requests the setting of a mode with a DECRQM sequence. The terminal responds with a DECRPM sequence. The host can then restore a saved setting with an SM or RM sequence. The following sections describe these sequences.

This update enables the DECRQM, DECRPM, SM, and RM sequences to support the following parameters in DEC private mode for the Greek and Hebrew dialects. See Chapter 12, "VT420 Reports," in the *VT420 Video Terminal Programmer Reference Manual* for more details.

Request Mode (DECRQM)—Host To VT420

The host sends this control function to find out if a particular mode is set or reset. The terminal responds with a report mode function (DECRPM).

There are two versions of the DECRQM function, for ANSI and DEC private modes. This update only provides additional DEC private modes.

Requesting DEC Private Modes

CSI	*?*	*Pd*	**$**	**p**
9/11	3/15	3/*n*	2/4	7/0

Parameters

Pd
indicates the DEC private mode the host is asking about. Table 8–1 lists the values for *Pd*.

Examples

The following sequence requests the setting of a DEC private mode:

Host Request	Meaning
CSI ? 36 $ p	What is the current state of Hebrew encoding mode (DECHEM)? (DECHEM = 36)

Notes on DECRQM

A DECRQM sequence can only ask about one mode at a time.

Table 8–1 DEC Private Modes for DECRQM, DECRPM, SM, and RM

Mode	Mnemonic	Pd
Cursor direction, right to left	DECRLM	34
(Hebrew) Keyboard mapping	DECHEBM	35
Hebrew encoding mode	DECHEM	36
(Greek) Keyboard mapping	DECNAKB	57

Report Mode (DECRPM)—VT420 To Host

The terminal sends this control function in response to a request mode (DECRQM) function. DECRPM informs the host whether a certain mode is set or reset.

Programming Tip

Applications can use the information in the DECRPM report to save the current mode settings. Later, the application can restore the saved mode settings.

This operation is useful for applications that need to temporarily change some of the terminal's mode settings. When the application is finished, it can restore the mode settings that were in effect before the application changed them. You use the set mode (SM) and reset mode (RM) functions to restore mode settings. SM and RM are described later in this chapter.

There are two versions of DECRPM, for ANSI and DEC private modes.

Reporting DEC Private Modes

CSI	**?**	*Pd*	*;*	*Ps*	**$**	**y**
9/11	3/15	3/*n*	3/11	3/*n*	2/4	7/9

Parameters

Pd
indicates which DEC private mode the terminal is reporting on. Table 8–1 lists the values for *Pd*.

Ps
indicates the setting of the mode. The *Ps* values are the same for the ANSI and DEC private versions.

Examples

The following sequence reports the setting of a DEC private mode:

VT420 Report	**Meaning**
CSI ? 57; h	(Greek) Keyboard mapping is currently set. (DECNAKB = 57, set = h)

Notes on DECRPM

The terminal can only report on one mode at a time.

Setting or Resetting Modes (SM and RM)

The DEC private mode has only two settings, set or reset. Soft terminal reset and hard terminal reset affect many control functions, including some DEC private modes.

Programming Tip

Applications can use the SM and RM functions to restore any number of VT420 modes to a desired state. See the Report Mode (DECRPM) section in this chapter for details.

Set Mode (SM)

This control function has two versions. You use the ANSI version to set one or more ANSI modes. You use the DEC private version to set one or more DEC private modes. You *cannot* set ANSI and DEC private modes with the same SM sequence.

Setting DEC Private Modes

CSI	**?**	*Pd*	**;**	**. . .**	*Pd*	**h**
9/11	3/15	3/*n*	3/11	. . .	3/*n*	6/8

Parameters

Pd
indicates a DEC private mode to set. Table 8–1 lists the *Pd* values for DEC private modes. You can use more than one *Pd* value in a sequence.

Examples

DEC Private Modes
The following sequence sets (Hebrew) keyboard mapping (DECHEBM) and Hebrew encoding mode (DECHEM):

```
CSI ? 34; 36 h
```

34 indicates (Hebrew) keyboard mapping.
36 indicates Hebrew encoding mode.

Reset Mode (RM)

There are two versions of this control function. You use the ANSI version to reset one or more ANSI modes. You use the DEC private version to reset one or more DEC private modes. You *cannot* reset ANSI and DEC private modes with the same RM sequence.

Resetting DEC Private Modes

CSI	**?**	*Pd*	**;**	**. . .**	**;**	*Pd*	**l**
9/11	3/15	3/*n*	3/11	. . .	3/11	3/*n*	6/12

Parameters

Pd
indicates a DEC private mode to reset. Table 8–1 lists the *Pd* values for DEC private modes. You can use more than one *Pd* value in a sequence.

Examples

DEC Private Modes
The following sequence resets (Hebrew) keyboard mapping (DECHEBM) and Hebrew encoding mode (DECHEM):

```
CSI ? 34; 36 l
```

34 indicates (Hebrew) keyboard mapping.
36 indicates Hebrew encoding mode.

Part 4
Emulating a Personal Computer

9

Emulating a Personal Computer

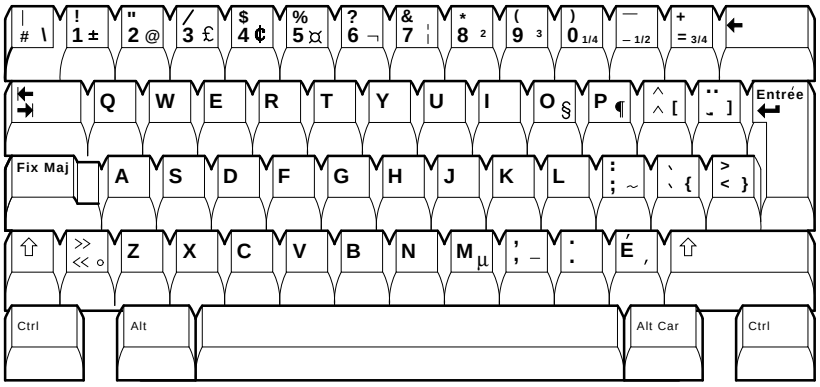
This chapter describes the additional personal computer (PC) keyboards and character sets you can use with your terminal: French/Canadian, Greek, Hebrew, and Turkish PC keyboards.

VT420 PC Keyboards

This section shows only the main keypad layout for the French/Canadian, Greek, Hebrew, and Turkish PC keyboards. The editing keypad, numeric keypad, and top-row function keys on these keyboards are identical to the PC keyboard described in the *VT420 Video Terminal Programmer Reference Manual*. See Chapter 3, "Keyboard Codes," for a description of the ANSI keyboards.

Figure 9–1 shows the French/Canadian PC keyboard.

Figure 9–1 French/Canadian PC Keyboard



MA-1437-92.DG

Figure 9–2 shows the Greek/N-A PC keyboard.

Figure 9–2 Greek/N-A PC Keyboard

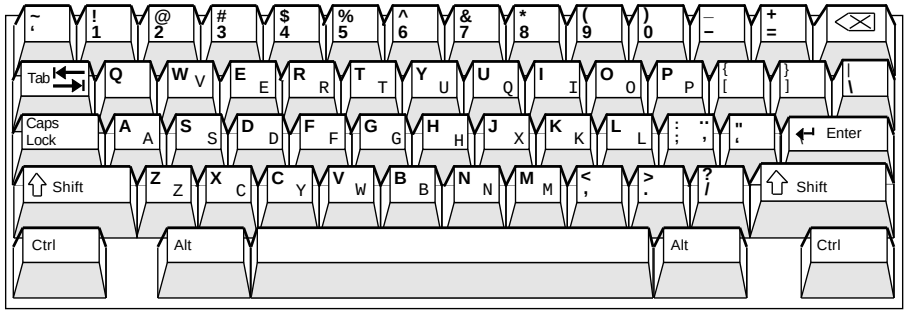


Figure 9–3 shows the Hebrew/N-A PC keyboard.

Figure 9–3 Hebrew/N-A PC Keyboard

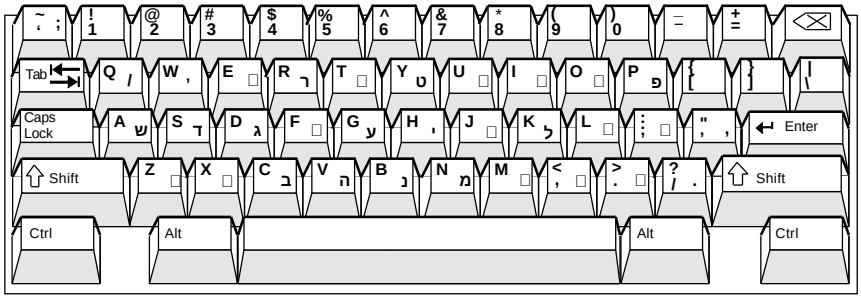
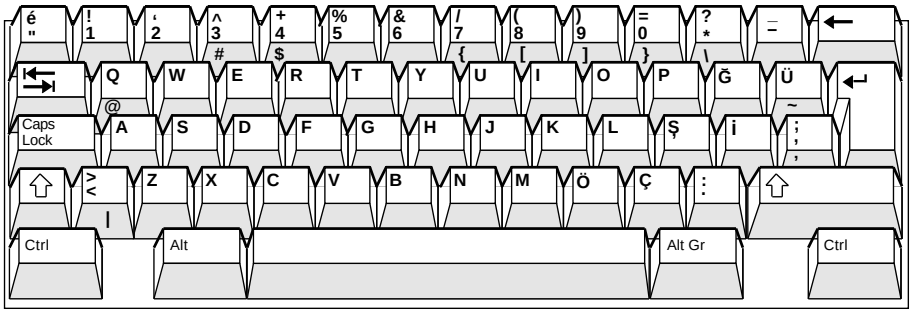


Figure 9–4 shows the Turkish PC keyboard.

Figure 9–4 Turkish PC Keyboard



VT420 PC Character Sets

The terminal provides the following additional built-in PC character sets for the French/Canadian, Greek, Hebrew, and Turkish languages:

- PC International (already exists for French/Canadian)
- PC Multilingual (already exists for French/Canadian)
- PC Greek
- PC Hebrew
- PC Turkish

Using PC Character Sets

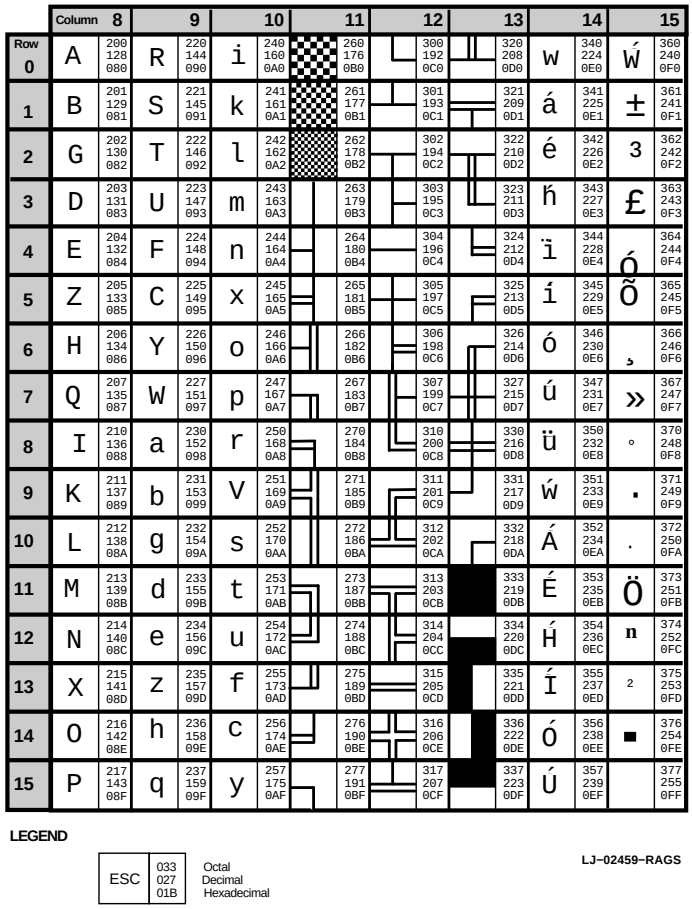
PC character sets only operate in the 8-bit character mode. You can select the PC character sets in PC TERM mode. You can use the following PC character sets with any PC keyboard, for example, the French/Canadian PC keyboard:

- PC Multinational
- PC International

You can use the PC Greek character set only with the Greek PC keyboard.

Figure 9–5 shows the PC Greek character set.

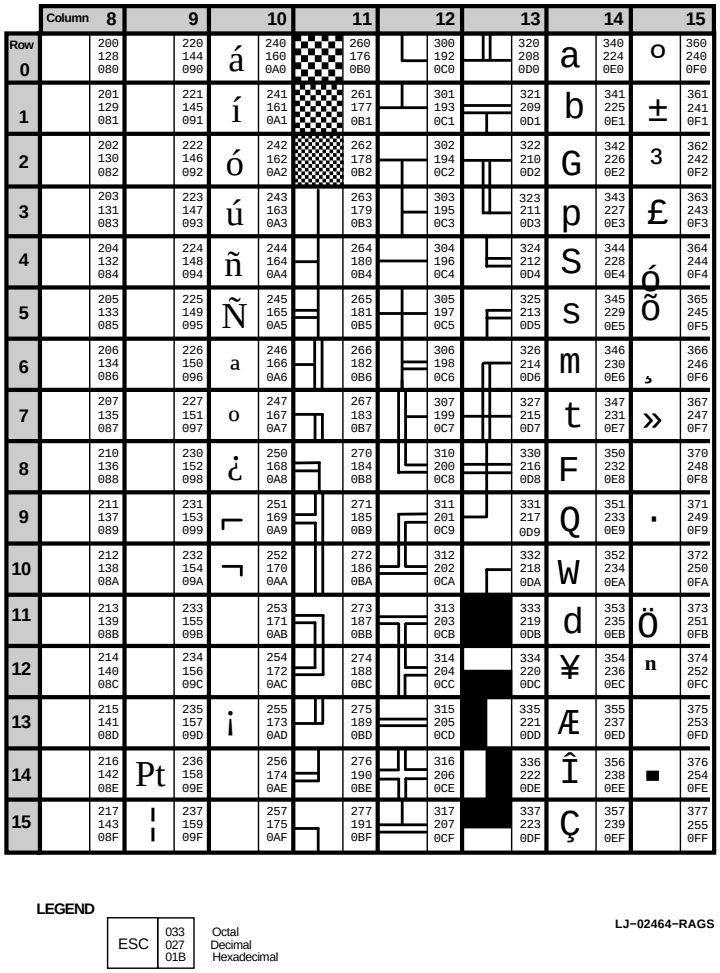
Figure 9–5 PC Greek Character Set



You can use the PC Hebrew character set only with the Hebrew PC keyboard.

Figure 9–6 shows the PC Hebrew character set.

Figure 9–6 PC Hebrew Character Set



You can use the PC Turkish character set only with the Turkish PC keyboard.

Figure 9–7 shows the PC Turkish character set.

Figure 9–7 PC Turkish Character Set

Row	Column 8		9		10		11		12		13		14		15	
0	Ç	200 128 080	É	220 144 090	á	240 160 0A0	▒	260 176 0B0	└	300 192 0C0	º	320 208 0D0	Ó	340 224 0E0	–	360 240 0F0
1	ü	201 129 081	æ	221 145 091	í	241 161 0A1	▒	261 177 0B1	┴	301 193 0C1	ª	321 209 0D1	b	341 225 0E1	±	361 241 0F1
2	é	202 130 082	Æ	222 146 092	ó	242 162 0A2	▒	262 178 0B2	┬	302 194 0C2	Ê	322 210 0D2	Ô	342 226 0E2		362 242 0F2
3	â	203 131 083	ô	223 147 093	ú	243 163 0A3	│	263 179 0B3	├	303 195 0C3	Ë	323 211 0D3	Ò	343 227 0E3	¾	363 243 0F3
4	ä	204 132 084	ö	224 148 094	ñ	244 164 0A4	┤	264 180 0B4	─	304 196 0C4	È	324 212 0D4	õ	344 228 0E4	¶	364 244 0F4
5	à	205 133 085	ò	225 149 095	Ñ	245 165 0A5	Á	265 181 0B5	┼	305 197 0C5		325 213 0D5	Õ	345 229 0E5	§	365 245 0F5
6	å	206 134 086	û	226 150 096	Ğ	246 166 0A6	Â	266 182 0B6	ã	306 198 0C6	Í	326 214 0D6	m	346 230 0E6	د	366 246 0F6
7	ç	207 135 087	ù	227 151 097	ğ	247 167 0A7	À	267 183 0B7	Ã	307 199 0C7	Î	327 215 0D7		347 231 0E7	د	367 247 0F7
8	ê	210 136 088	İ	230 152 098	¿	250 168 0A8	©	270 184 0B8	╚	310 200 0C8	Ï	330 216 0D8	×	350 232 0E8	◦	370 248 0F8
9	ë	211 137 089	Ö	231 153 099	®	251 169 0A9	╣	271 185 0B9	╔	311 201 0C9	┘	331 217 0D9	Ú	351 233 0E9	¨	371 249 0F9
10	è	212 138 08A	Ü	232 154 09A	¬	252 170 0AA	║	272 186 0BA	╩	312 202 0CA	┌	332 218 0DA	Û	352 234 0EA	·	372 250 0FA
11	ï	213 139 08B	ø	233 155 09B	½	253 171 0AB	╗	273 187 0BB	╦	313 203 0CB	■	333 219 0DB	Ù	353 235 0EB	1	373 251 0FB
12	î	214 140 08C	£	234 156 09C	¼	254 172 0AC	╝	274 188 0BC	╠	314 204 0CC		334 220 0DC	ì	354 236 0EC	3	374 252 0FC
13	ı	215 141 08D	Ø	235 157 09D	¡	255 173 0AD	¢	275 189 0BD	═	315 205 0CD	¦	335 221 0DD	ÿ	355 237 0ED	2	375 253 0FD
14	Ä	216 142 08E	Ş	236 158 09E	«	256 174 0AE	¥	276 190 0BE	╬	316 206 0CE	Ì	336 222 0DE	˘	356 238 0EE	■	376 254 0FE
15	Å	217 143 08F	ş	237 159 09F	»	257 175 0AF	┐	277 191 0BF	¤	317 207 0CF	■	337 223 0DF	´	357 239 0EF	SP	377 255 0FF

LEGEND

ESC	033 027 01B	Octal Decimal Hexadecimal

LJ−02469−RAGS

Enabling or Disabling PC TERM Mode

You can enable and disable PC TERM mode from the General Set-Up screen or by using the change emulation mode sequence.

Change Emulation Mode

In this mode, the terminal can use only one PC character set at a time.

Format

ESC	[	?	Ps	;	Pc	r
1/11	5/11	3/15	3/n	3/11	3/n	7/2

Parameters

Ps
selects the operating mode.

Ps	Operating Mode
0 (default)	VT mode with a PC keyboard
1	PC TERM mode

Pc
selects one PC character set or a UPSS character set.

Pc	Character Set
0 (default)	default
1	PC Multilingual
2	PC International
3	PC Danish/Norwegian
4	PC Spanish
5	PC Portuguese
6	UPSS DEC Supplemental

Pc	Character Set
7	UPSS ISO Latin-1
210	PC Greek
862	PC Hebrew
857	PC Turkish

User-Defined Keys (DECUDK for PC TERM)

This section describes the UDKs for the keyboards used with the VT420 with PC TERM mode. Refer to Chapter 7 for a description of the UDKs for the keyboards used with the original VT420.

The following keyboards have the following user-defined keys (UDKs):

ANSI Keyboard

F1 to F20
Shift F1 to Shift F20

Short ANSI Keyboard

F1 to F10
Extend F1 to Extend F10
Shift F1 to Shift F10
Shift Extend F1 to Shift Extend F10

PC Keyboard

F1 to F12
Shift F1 to Shift F12
Alt F1 to Alt F12
Alt Shift F1 Alt Shift F12

The following five keys on the ANSI keyboards—F1 (Hold), F2 (Print), F3 (Set-Up), F4 (Session), and F5 (Break)—have dedicated local functions. You can change the function of keys F1 to F4 on the ANSI keyboards by using the local function key control (DECLFKC) function. Applications cannot disable the F5 (Break) key.

Using UDKs

User-defined keys (UDKs) are only available in VT400 mode and PC TERM mode. UDKs do not work in VT100 and VT52 modes.

You define the function of keys by using a DECUDK device control string, as described in the Programming UDKs section that follows. After you define a key, you can use the new function by pressing

Shift *key*

where *key* is the key you defined. This chapter describes how to program the keys by using a DECUDK device control string.

UDK Memory Space

There are 768 bytes of memory available for the 48 user-defined keys. Space is supplied on a first-come/first-serve basis. When the 768 bytes are full, you cannot define any more keys until you clear some of the memory space. There are three ways you can clear space.

- Redefine one or more UDKs, with a DECUDK control string.
- Clear one or more UDKs, with a DECUDK control string.
- Clear all UDKs, with a terminal power-up or reset (RIS) operation.

Programming UDKs

You use the following device control string format to download definitions for user-defined keys. See Chapter 2, "Character Encoding," for general information about device control strings.

Available in: VT400 mode and PC TERM mode only.

Format

DCS Device Control String Introducer	*Pc ; Pl ; Pm* Clear, Lock, and Modifier	**|** Final Character	*Ky1/St1;...Kyn/Stn* Key Definition String	**ST** String Terminator

Parameters

DCS (9/0)
indicates the beginning of a device control string. DCS is an 8-bit C1 character. You can use ESC P (1/11 5/0) for a 7-bit environment.

Pc
is the *clear parameter*. *Pc* selects how to clear key definitions.

Pc	Action
0 (default) or none	Clear all keys before loading new values.
1	Clear one key at a time, before loading a new value.

When *Pc* is 1, the terminal only clears the keys you are loading. By using a *Pc* value of 1, you can redefine some keys without redefining them all.

NOTE

There are 768 bytes of memory for all user-defined keys. A key definition can only use the number of bytes available when that key is loaded.

Programming Tip

If *Pc* is 1, a key load may fail because no memory space is available. The reason for this is as follows.

With *Pc* set to 1, keys are cleared and loaded sequentially. If the new definition for a key is larger than the old one, you may exceed the 768 byte limit.

For example, suppose F6 contains 412 bytes, F7 contains 330 bytes, and F8 contains 20 bytes. You try to load F8 with 40 bytes, F6 with 1 byte, and F7 with 1 byte, in that order. This works if all keys are cleared first (*Pc* is 0), but not if keys are cleared one at a time (*Pc* is 1). When you try to load F8 with 40 bytes, the load fails because only 26 bytes are free at that time.

768 (maximum) – 412 (F6) – 330 (F7) = 26

Pl
is the *lock parameter*. *Pl* determines whether the key definitions are locked or unlocked after you load them.

Pl	Action
0 or none	Lock the keys. If you want to load new values into the keys, you must unlock the keys by using set-up.
1	Do not lock the keys. The keys are unlocked and can be redefined with another DECUDK string.

If *Pl* is 1 and the keys are already locked, nothing happens.

The terminal uses a special lock to prevent or allow the programming of user-defined keys. You can turn on this lock from set-up or from the host (with a DECUDK device control string). The lock affects all programmable keys. When you use the lock, you should follow these guidelines:

- **Unlock the keys to define them.**

  The keys must be unlocked before you can define them. You can only unlock the keys from set-up. If a key is locked and an application tries to redefine the key with a DECUDK sequence, the terminal ignores the sequence.

- **Lock the keys to prevent redefinition.**

  You can lock the keys from set-up or from the host (by sending a DECUDK sequence). New key definitions are locked by default.

Pm

is the *modifier parameter*. *Pm* designates whether the key is shifted or unshifted.

Pm	**Action**
0, 2, or none	Define the shifted function key.
1	Defines the unshifted function key.
3	Defines the alternate unshifted function key.
4	Defines the alternate shifted function key.

|

is the *final character*. The vertical bar (7/12) identifies this control string as a DECUDK.

Ky1/St1;...Kyn/Stn

are the *key definition strings*. You include these strings between the final character (|) and the string terminator (ST). Each string consists of a key selector number (*Kyn*) and a string parameter (*Stn*), separated by a slash (/, 2/15). A semicolon (3/11) separates different strings.

- The key selector number (**Kyn**) indicates which key you are defining. Tables 9–1 and 9–2 list the definable keys and their identifying values.

Table 9–1 ANSI and Short ANSI Keyboards

	Pm = 1		Pm = none, 0, or 2	
Kyn	**ANSI**	**Short ANSI**	**ANSI**	**Short ANSI**
11	F1	F1	Shift F1	Shift F1
12	F2	F2	Shift F2	Shift F2
13	F3	F3	Shift F3	Shift F3
14	F4	F4	Shift F4	Shift F4
15	F5	F5	Shift F5	Shift F5
17	F6	F6	Shift F6	Shift F6
18	F7	F7	Shift F7	Shift F7
19	F8	F8	Shift F8	Shift F8
20	F9	F9	Shift F9	Shift F9
21	F10	F10	Shift F10	Shift Extend F10
23	F11	Extend F1	Shift F11	Shift Extend F1
24	F12	Extend F2	Shift F12	Shift Extend F2
25	F13	Extend F3	Shift F13	Shift Extend F3
26	F14	Extend F4	Shift F14	Shift Extend F4
28	F15	Extend F5	Shift F15	Shift Extend F5
29	F16	Extend F6	Shift F16	Shift Extend F6
31	F17	Extend F7	Shift F17	Shift Extend F7
32	F18	Extend F8	Shift F18	Shift Extend F8
33	F19	Extend F9	Shift F19	Shift Extend F9
34	F20	Extend F10	Shift F20	Shift Extend F10

NOTE

Pm values of 3 and 4 are specific to the PC keyboard. They are ignored when you use an ANSI or short ANSI keyboard.

Table 9–2 PC Keyboards

	Pm Value			
Kyn	**1**	**None, 0, or 2**	**3**	**4**
11	F1	Shift F1	Alt F1	Alt Shift F1
12	F2	Shift F2	Alt F2	Alt Shift F2
13	F3	Shift F3	Alt F3	Alt Shift F3
14	F4	Shift F4	Alt F4	Alt Shift F4
15	F5	Shift F5	Alt F5	Alt Shift F5
17	F6	Shift F6	Alt F6	Alt Shift F6
18	F7	Shift F7	Alt F7	Alt Shift F7
19	F8	Shift F8	Alt F8	Alt Shift F8
20	F9	Shift F9	Alt F9	Alt Shift F9
21	F10	Shift F10	Alt F10	Alt Shift F10
23	F11	Shift F11	Alt F11	Alt Shift F11
24	F12	Shift F12	Alt F12	Alt Shift F12
25	Alt F3	Alt Shift F3	–	–
26	Alt F4	Alt Shift F4	–	–
28	Alt F5	Alt Shift F5	–	–
29	Alt F6	Alt Shift F6	–	–
31	Alt F7	Alt Shift F7	–	–
32	Alt F8	Alt Shift F8	–	–
33	Alt F9	Alt Shift F9	–	–
34	Alt F10	Alt Shift F10	–	–
35	Alt F11	Alt Shift F11	–	–
36	Alt F12	Alt Shift F12	–	–

- The string parameters (**Stn**) are the encoded definition of the keys. String parameters consist of hex pairs in the following ranges:

  3/0 through 3/9 (0 through 9)
  4/1 through 4/6 (A through F)
  6/1 through 6/6 (a through f)

  When you combine these hex values, they represent an 8-bit quantity. The ASCII table in Chapter 2 lists the hex values of characters.

  This method lets you use any of the 256 character codes in the key string. You can enter key definition strings in any order.

  Default: Empty. The key is undefined.

ST

is the *string terminator*. ST (9/12) is a C1 8-bit character. You can use ESC \ (1/11, 5/12) for a 7-bit environment.

Notes On Loading UDKs

Here are some general guidelines you should keep in mind when loading UDKs.

- **Clear UDK memory space before loading new definitions.**

  Use a DECUDK string to clear keys without locking them. Then you can use another DECUDK string to redefine the keys and lock them.

- **If you redefine a key, the old definition is lost.**

  This may clear some space if the new definition uses less bytes than the old one.

- **There is only one way to unlock UDKs.**

  To unlock UDKs, you must use the General Set-Up screen.

- **The value for each key definition is empty.**

  When you clear UDKs, they are empty.

- **An invalid hex pair in a DECUDK string stops a UDK load sequence.**

  When a load sequence stops (due to error or other cause), the terminal saves any keys already loaded and sends the rest of the DECUDK sequence to the screen.

Examples of DECUDK Device Control Strings

The following sequence clears unshifted UDKs:

```
DCS 0 ; 1 ; 1 | ST
```

The following sequence locks unshifted UDKs:

```
DCS 1 ; 0 ; 1 | ST
```

Suppose you want to define the unshifted F20 key to be "PRINT", without clearing or locking any other keys. The first part of your sequence would look like this:

```
DCS 1 ; 1 ; 1 | 3 4 /
```

34 is the code for the F20 key.

After the slash character (/, 2/15), you include the definition. The rest of the sequence after the slash character would look like this:

```
5 0 5 2 4 9 4 E 5 4 ST
```

The hex encoding for "PRINT" is as follows:

50 = P

52 = R

49 = I

4E = N

54 = T

The ST character (9/12) marks the end of the control string.

The complete string is as follows:

```
DCS 1 ; 1 ; 1 | 34 / 50 52 49 4E 54 ST
```

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