# Code Page 437 (CP437) Character Reference

This document provides a comprehensive reference for the Code Page 437 (CP437) character set, which is the original IBM PC character set used in MS-DOS and early computer systems. This 8x8 pixel font contains 256 characters (0x00 to 0xFF) and is famous for its extensive collection of graphical symbols, box-drawing characters, and international characters.

#### Overview

Code Page 437 was the default character set for IBM PC and compatible computers from 1981 to the mid-1990s. It includes:

- Control characters (0x00-0x1F)
- Standard ASCII (0x20-0x7E)
- Extended characters (0x80-0xFF) including:
  - o International characters with diacritics
  - Mathematical symbols
  - Greek letters
  - Box-drawing and line characters
  - Shading patterns

#### **Character Table**

Dec	Hex	<b>Character Name (Common)</b>	Display
0	0x00	<b>NULL</b> (Null character)	(null)
1	0x01	Smiling Face (White)	©
2	0x02	Smiling Face (Black)	•
3	0x03	Heart	•
4	0x04	Diamond	•
5	0x05	Club	•
6	0x06	Spade	•
7	0x07	Bullet (Fill)	•
8	0x08	Bullet (Hollow)	٥
9	0x09	Circle (Hollow)	0
10	0x0A	Bullet (Inverted)	0
11	0x0B	Male Symbol	3
12	0x0C	Female Symbol	\$
13	0x0D	Musical Note	ľ
	-		·

Dec	Hex	Character Name (Common)	Display
14	0x0E	Double Musical Note	,,
15	0x0F	Sun	₩
16	0x10	Right-pointing Triangle	<b>&gt;</b>
17	0x11	Left-pointing Triangle	4
18	0x12	Up/Down Arrow	<b>\$</b>
19	0x13	Double Exclamation	!!
20	0x14	Paragraph/Pilcrow	¶
21	0x15	Section Sign	§
22	0x16	Rectangle (Hollow)	•
23	0x17	Up/Down Arrow with Base	<u></u>
24	0x18	Up Arrow	<u> </u>
25	0x19	Down Arrow	ţ
26	0x1A	Right Arrow	$\rightarrow$
27	0x1B	Left Arrow	<b>←</b>
28	0x1C	L-shape/Corner	L
29	0x1D	Left-Right Arrow	$\leftrightarrow$
30	0x1E	Upward Triangle	<b>A</b>
31	0x1F	Downward Triangle	▼
32	0x20	Space	(space)
33	0x21	Exclamation Mark	!
34	0x22	Quotation Mark	II
35	0x23	Number Sign	#
36	0x24	Dollar Sign	\$
37	0x25	Percent Sign	%
38	0x26	Ampersand	&
39	0x27	Apostrophe	ı
40	0x28	Left Parenthesis	(
41	0x29	Right Parenthesis	)
42	0x2A	Asterisk	*
43	0x2B	Plus Sign	+

Dec	Hex	Character Name (Common)	Display
44	0x2C	Comma	,
45	0x2D	Hyphen-Minus	-
46	0x2E	Period	
47	0x2F	Slash	/
48	0x30	Digit Zero	0
49	0x31	Digit One	1
50	0x32	Digit Two	2
51	0x33	Digit Three	3
52	0x34	Digit Four	4
53	0x35	Digit Five	5
54	0x36	Digit Six	6
55	0x37	Digit Seven	7
56	0x38	Digit Eight	8
57	0x39	Digit Nine	9
58	0x3A	Colon	:
59	0x3B	Semicolon	;
60	0x3C	Less-than Sign	<
61	0x3D	Equals Sign	=
62	0x3E	Greater-than Sign	>
63	0x3F	Question Mark	?
64	0x40	Commercial At	@
65	0x41	Capital A	А
66	0x42	Capital B	В
67	0x43	Capital C	С
68	0x44	Capital D	D
69	0x45	Capital E	E
70	0x46	Capital F	F
71	0x47	Capital G	G
72	0x48	Capital H	Н
73	0x49	Capital I	I

Dec	Hex	Character Name (Common)	Display
74	0x4A	Capital J	J
75	0x4B	Capital K	К
76	0x4C	Capital L	L
77	0x4D	Capital M	М
78	0x4E	Capital N	N
79	0x4F	Capital O	0
80	0x50	Capital P	Р
81	0x51	Capital Q	Q
82	0x52	Capital R	R
83	0x53	Capital S	S
84	0x54	Capital T	T
85	0x55	Capital U	U
86	0x56	Capital V	V
87	0x57	Capital W	W
88	0x58	Capital X	Х
89	0x59	Capital Y	Υ
90	0x5A	Capital Z	Z
91	0x5B	Left Bracket	[
92	0x5C	Backslash	\
93	0x5D	Right Bracket	]
94	0x5E	Caret/Circumflex	٨
95	0x5F	Underscore	-
96	0x60	Grave Accent	`
97	0x61	Small A	а
98	0x62	Small B	b
99	0x63	Small C	С
100	0x64	Small D	d
101	0x65	Small E	е
102	0x66	Small F	f
103	0x67	Small G	g

Dec	Hex	<b>Character Name (Common)</b>	Display
104	0x68	Small H	h
105	0x69	Small I	i
106	0x6A	Small J	j
107	0x6B	Small K	k
108	0x6C	Small L	1
109	0x6D	Small M	m
110	0x6E	Small N	n
111	0x6F	Small O	0
112	0x70	Small P	р
113	0x71	Small Q	q
114	0x72	Small R	r
115	0x73	Small S	S
116	0x74	Small T	t
117	0x75	Small U	u
118	0x76	Small V	V
119	0x77	Small W	W
120	0x78	Small X	Х
121	0x79	Small Y	у
122	0x7A	Small Z	Z
123	0x7B	Left Curly Bracket	{
124	0x7C	Vertical Bar	I
125	0x7D	Right Curly Bracket	}
126	0x7E	Tilde	~
127	0x7F	House	۵

# Extended Characters (0x80-0xFF)

Dec	Hex	Character Name (Common)	Display
128	0x80	C-cedilla	Ç
129	0x81	U-umlaut	ü
130	0x82	E-acute	é

Dec	Hex	Character Name (Common)	Display
131	0x83	A-circumflex	â
132	0x84	A-umlaut	ä
133	0x85	A-grave	à
134	0x86	A-ring	å
135	0x87	C-cedilla (small)	Ç
136	0x88	E-circumflex	ê
137	0x89	E-umlaut	ë
138	0x8A	E-grave	è
139	0x8B	l-umlaut	ï
140	0x8C	I-circumflex	î
141	0x8D	l-grave	ì
142	0x8E	A-umlaut (cap)	Ä
143	0x8F	A-ring (cap)	Å
144	0x90	E-acute (cap)	É
145	0x91	AE-ligature	æ
146	0x92	AE-ligature (cap)	Æ
147	0x93	O-circumflex	ô
148	0x94	O-umlaut	Ö
149	0x95	O-grave	ò
150	0x96	U-circumflex	û
151	0x97	U-grave	ù
152	0x98	Y-umlaut	ÿ
153	0x99	O-umlaut (cap)	Ö
154	0x9A	U-umlaut (cap)	Ü
155	0x9B	Cent Sign	¢
156	0x9C	Pound Sterling	£
157	0x9D	Yen	¥
158	0x9E	P-with-hook	Pts
159	0x9F	Florin/F-hook	f
160	0xA0	A-acute	á

Dec	Hex	Character Name (Common)	Display
161	0xA1	l-acute	í
162	0xA2	O-acute	ó
163	0xA3	U-acute	ú
164	0xA4	N-tilde	ñ
165	0xA5	N-tilde (cap)	Ñ
166	0xA6	Feminine Ordinal	а
167	0xA7	Masculine Ordinal	0
168	0xA8	Inverted Question Mark	į
169	0xA9	Registered Sign	F
170	0xAA	NOT Sign	٦
171	0xAB	One-Half	1/2
172	0xAC	One-Quarter	1/4
173	0xAD	Exclamation Mark (Inverted)	i
174	0xAE	Left Double Angle Quote	«
175	0xAF	Right Double Angle Quote	»

Box Drawing and Shading Characters (0xB0-0xDF)

Dec	Hex	Character Name (Common)	Display
176	0xB0	Light Shade	
177	0xB1	Medium Shade	*****
178	0xB2	Dark Shade	
179	0xB3	Single Vertical Line	
180	0xB4	Single Vertical and Right	-{
181	0xB5	Vertical Double/Single Right	=
182	0xB6	Single Vertical/Double Right	1
183	0xB7	Double Top Left Corner	П
184	0xB8	Double Top Right Corner	٦
185	0xB9	Double Vertical and Right	4
186	0xBA	Double Vertical Line	
187	0xBB	Double Top Right Corner	╗
	·	· · · · · · · · · · · · · · · · · · ·	·

188       0xBC       Double Bottom Right Corner       □         189       0xBD       Double Bottom Left Corner       □         190       0xBE       Double Top Left Corner       □         191       0xBF       Single Top Right Corner       □         192       0xC0       Single Bottom Left Corner       □         193       0xC1       Single Horizontal and Up       □         194       0xC2       Single Horizontal and Down       □         195       0xC3       Single Vertical and Right       □         196       0xC4       Single Horizontal Line       □         197       0xC5       Single Cross       □         198       0xC6       Double Vertical and Single Right       □         199       0xC7       Single Vertical and Double Right       □         200       0xC8       Double Bottom Left Corner       □         201       0xC9       Double Horizontal and Up       □         202       0xCA       Double Horizontal and Down       □         203       0xCB       Double Horizontal and Down       □         204       0xCC       Double Horizontal and Double Up       □         205       0xCD       Do	Dec	Hex	Character Name (Common)	Display
190 0xBE Double Top Left Corner  191 0xBF Single Top Right Corner  192 0xC0 Single Bottom Left Corner  193 0xC1 Single Horizontal and Up  194 0xC2 Single Horizontal and Down  195 0xC3 Single Vertical and Right  196 0xC4 Single Horizontal Line  197 0xC5 Single Cross  198 0xC6 Double Vertical and Single Right  199 0xC7 Single Vertical and Double Right  199 0xC7 Single Vertical and Double Right  190 0xC8 Double Bottom Left Corner  201 0xC9 Double Horizontal and Up  202 0xCA Double Horizontal and Up  203 0xCB Double Horizontal and Down  1 □  204 0xCC Double Vertical and Single Right  205 0xCD Double Horizontal Line  206 0xCE Double Vertical and Single Right  207 0xCF Single Horizontal Line  208 0xD0 Double Horizontal Line  209 0xD1 Single Horizontal and Double Up  209 0xD1 Single Horizontal and Single Up  210 0xD2 Double Horizontal and Single Down  211 0xD3 Single Vertical and Single Down  211 0xD3 Single Vertical and Double Left  212 0xD4 Double Vertical and Double Left  213 0xD5 Single Vertical and Double Left  □	188	0xBC	Double Bottom Right Corner	ī
191 0xBF Single Top Right Corner	189	0xBD	Double Bottom Left Corner	Ш
192 0xC0 Single Bottom Left Corner  193 0xC1 Single Horizontal and Up  194 0xC2 Single Horizontal and Down  195 0xC3 Single Vertical and Right  196 0xC4 Single Horizontal Line  197 0xC5 Single Cross  198 0xC6 Double Vertical and Single Right  199 0xC7 Single Vertical and Double Right  199 0xC7 Single Vertical and Double Right  190 0xC8 Double Bottom Left Corner  201 0xC9 Double Horizontal and Up  202 0xCA Double Horizontal and Up  203 0xCB Double Horizontal and Down  107  204 0xCC Double Vertical and Single Right  108  209 0xCB Double Horizontal Line  206 0xCE Double Horizontal Line  207 0xCF Single Horizontal and Double Up  208 0xD0 Double Horizontal and Double Up  209 0xD1 Single Horizontal and Double Down  210 0xD2 Double Horizontal and Single Down  211 0xD3 Single Vertical and Single Left  212 0xD4 Double Vertical and Double Left  213 0xD5 Single Vertical and Double Left  □	190	0xBE	Double Top Left Corner	]
193 0xCl Single Horizontal and Up	191	0xBF	Single Top Right Corner	7
194 0xC2 Single Horizontal and Down T 195 0xC3 Single Vertical and Right	192	0xC0	Single Bottom Left Corner	L
195 0xC3 Single Vertical and Right	193	0xC1	Single Horizontal and Up	Т
196 OxC4 Single Horizontal Line —  197 OxC5 Single Cross	194	0xC2	Single Horizontal and Down	Т
197 0xC5 Single Cross	195	0xC3	Single Vertical and Right	ŀ
198 0xC6 Double Vertical and Single Right   F 199 0xC7 Single Vertical and Double Right   F 200 0xC8 Double Bottom Left Corner   F 201 0xC9 Double Top Left Corner   F 202 0xCA Double Horizontal and Up   F 203 0xCB Double Horizontal and Down   F 204 0xCC Double Vertical and Single Right   F 205 0xCD Double Horizontal Line   F 206 0xCE Double Cross   F 207 0xCF Single Horizontal and Double Up   F 208 0xD0 Double Horizontal and Double Up   F 209 0xD1 Single Horizontal and Double Down   F 210 0xD2 Double Horizontal and Single Down   F 211 0xD3 Single Vertical and Double Left   F 212 0xD4 Double Vertical and Double Left   F 213 0xD5 Single Vertical and Double Left   F 214 0xD6 Double Vertical and Single Left   F	196	0xC4	Single Horizontal Line	_
199 0xC7 Single Vertical and Double Right  200 0xC8 Double Bottom Left Corner  201 0xC9 Double Top Left Corner  202 0xCA Double Horizontal and Up  203 0xCB Double Horizontal and Down  TOPE 204 0xCC Double Vertical and Single Right  205 0xCD Double Horizontal Line  206 0xCE Double Cross  207 0xCF Single Horizontal and Double Up  208 0xD0 Double Horizontal and Single Up  209 0xD1 Single Horizontal and Double Down  210 0xD2 Double Horizontal and Single Down  211 0xD3 Single Vertical and Double Left  212 0xD4 Double Vertical and Double Left  213 0xD5 Single Vertical and Double Left  Tope 205 In	197	0xC5	Single Cross	+
200       0xC8       Double Bottom Left Corner       L         201       0xC9       Double Top Left Corner       □         202       0xCA       Double Horizontal and Up       ⊥         203       0xCB       Double Horizontal and Down       □         204       0xCC       Double Vertical and Single Right       □         205       0xCD       Double Horizontal Line       =         206       0xCE       Double Cross       □         207       0xCF       Single Horizontal and Double Up       ⊥         208       0xD0       Double Horizontal and Single Up       ⊥         209       0xD1       Single Horizontal and Double Down       □         210       0xD2       Double Horizontal and Single Down       □         211       0xD3       Single Vertical and Double Left       L         212       0xD4       Double Vertical and Single Left       □         213       0xD5       Single Vertical and Single Left       □         214       0xD6       Double Vertical and Single Left       □	198	0xC6	Double Vertical and Single Right	ŧ
201 0xC9 Double Top Left Corner	199	0xC7	Single Vertical and Double Right	<u> </u>
202 0xCA Double Horizontal and Up  203 0xCB Double Horizontal and Down  T  204 0xCC Double Vertical and Single Right  205 0xCD Double Horizontal Line  206 0xCE Double Cross  T  207 0xCF Single Horizontal and Double Up  208 0xD0 Double Horizontal and Single Up  209 0xD1 Single Horizontal and Double Down  210 0xD2 Double Horizontal and Single Down  211 0xD3 Single Vertical and Double Left  212 0xD4 Double Vertical and Single Left  213 0xD5 Single Vertical and Double Left  T  214 0xD6 Double Vertical and Single Left  □	200	0xC8	Double Bottom Left Corner	L
203 0xCB Double Horizontal and Down  204 0xCC Double Vertical and Single Right  205 0xCD Double Horizontal Line  206 0xCE Double Cross  ☐  207 0xCF Single Horizontal and Double Up  208 0xD0 Double Horizontal and Single Up  209 0xD1 Single Horizontal and Double Down  ☐  210 0xD2 Double Horizontal and Single Down  ☐  211 0xD3 Single Vertical and Double Left  ☐  212 0xD4 Double Vertical and Single Left  ☐  213 0xD5 Single Vertical and Double Left  ☐  214 0xD6 Double Vertical and Single Left  ☐  ☐  ☐  ☐  ☐  ☐  ☐  ☐  ☐  ☐  ☐  ☐  ☐	201	0xC9	Double Top Left Corner	F
204 0xCC Double Vertical and Single Right  205 0xCD Double Horizontal Line =  206 0xCE Double Cross	202	0xCA	Double Horizontal and Up	Ш
205       OxCD       Double Horizontal Line       =         206       0xCE       Double Cross       ⋕         207       0xCF       Single Horizontal and Double Up       ±         208       0xD0       Double Horizontal and Single Up       ±         209       0xD1       Single Horizontal and Double Down       〒         210       0xD2       Double Horizontal and Single Down       Ⅲ         211       0xD3       Single Vertical and Double Left       止         212       0xD4       Double Vertical and Single Left       上         213       0xD5       Single Vertical and Double Left       盾         214       0xD6       Double Vertical and Single Left       盾	203	0xCB	Double Horizontal and Down	ī
206 0xCE Double Cross   1	204	0xCC	Double Vertical and Single Right	ŀ
207 0xCF Single Horizontal and Double Up    208 0xD0 Double Horizontal and Single Up    209 0xD1 Single Horizontal and Double Down    210 0xD2 Double Horizontal and Single Down    211 0xD3 Single Vertical and Double Left    212 0xD4 Double Vertical and Single Left    213 0xD5 Single Vertical and Double Left    214 0xD6 Double Vertical and Single Left    □	205	0xCD	<b>Double Horizontal Line</b>	=
208 0xD0 Double Horizontal and Single Up  209 0xD1 Single Horizontal and Double Down  T  210 0xD2 Double Horizontal and Single Down  T  211 0xD3 Single Vertical and Double Left  L  212 0xD4 Double Vertical and Single Left  L  213 0xD5 Single Vertical and Double Left  F  214 0xD6 Double Vertical and Single Left  T	206	0xCE	Double Cross	#
209 0xD1 Single Horizontal and Double Down $\overline{}$ 210 0xD2 Double Horizontal and Single Down $\overline{}$ 211 0xD3 Single Vertical and Double Left $\overline{}$ 212 0xD4 Double Vertical and Single Left $\overline{}$ 213 0xD5 Single Vertical and Double Left $\overline{}$ 214 0xD6 Double Vertical and Single Left $\overline{}$	207	0xCF	Single Horizontal and Double Up	<b>T</b>
210 0xD2 Double Horizontal and Single Down  T  211 0xD3 Single Vertical and Double Left  L  212 0xD4 Double Vertical and Single Left  L  213 0xD5 Single Vertical and Double Left  F  214 0xD6 Double Vertical and Single Left  T	208	0xD0	Double Horizontal and Single Up	Ш
211 0xD3 Single Vertical and Double Left  L  212 0xD4 Double Vertical and Single Left  L  213 0xD5 Single Vertical and Double Left  Double Vertical and Single Left  Double Vertical and Single Left  T	209	0xD1	Single Horizontal and Double Down	₹
212 0xD4 Double Vertical and Single Left  213 0xD5 Single Vertical and Double Left  214 0xD6 Double Vertical and Single Left  [T]	210	0xD2	Double Horizontal and Single Down	Т
213 0xD5 Single Vertical and Double Left F  214 0xD6 Double Vertical and Single Left	211	0xD3	Single Vertical and Double Left	L
214 0xD6 Double Vertical and Single Left	212	0xD4	Double Vertical and Single Left	F
	213	0xD5	Single Vertical and Double Left	F
215 0xD7 Vertical Double/Horizontal Single Cross #	214	0xD6	Double Vertical and Single Left	Г
	215	0xD7	Vertical Double/Horizontal Single Cross	#
216 0xD8 Vertical Single/Horizontal Double Cross +	216	0xD8	Vertical Single/Horizontal Double Cross	+
217 0xD9 Single Bottom Right Corner J	217	0xD9	Single Bottom Right Corner	٦

Dec	Hex	<b>Character Name (Common)</b>	Display
218	0xDA	Single Top Left Corner	Г
219	0xDB	Full Block	
220	0xDC	Bottom Half Block	•
221	0xDD	Left Half Block	ı
222	0xDE	Right Half Block	I
223	0xDF	Top Half Block	•

# Mathematical and Greek Characters (0xE0-0xFF)

224       0xE0       Alpha       α         225       0xE1       Beta       β         226       0xE2       Gamma       Γ         227       0xE3       Pi $\pi$ 228       0xE4       Sigma $\Sigma$ 229       0xE5       Small Sigma $\sigma$ 230       0xE6       Mu $\mu$ 231       0xE7       Tau $\tau$ 232       0xE8       Phi $\Phi$ 233       0xE9       Theta $\Theta$ 234       0xEA       Omega $\Omega$ 235       0xEB       Delta $\delta$ 236       0xEC       Infinity $\infty$ 237       0xED       Phi (small) $\phi$ 238       0xEE       Epsilon $\varepsilon$ 239       0xEF       Intersection $\cap$ 240       0xF0       Identity $\varepsilon$ 241       0xF1       Plus-minus $\varepsilon$ 242       0xF2       Greater-or-equal $\varepsilon$ 243       0xF4       Integral Top $\varepsilon$	Dec	Hex	Character Name (Common)	Display
226       0xE2       Gamma       Γ         227       0xE3       Pi $\pi$ 228       0xE4       Sigma $\Sigma$ 229       0xE5       Small Sigma $\sigma$ 230       0xE6       Mu $\mu$ 231       0xE7       Tau $\tau$ 232       0xE8       Phi $\Phi$ 233       0xE9       Theta $\Theta$ 234       0xEA       Omega $\Omega$ 235       0xEB       Delta $\delta$ 236       0xEC       Infinity $\infty$ 237       0xED       Phi (small) $\phi$ 238       0xEE       Epsilon $\epsilon$ 239       0xEF       Intersection $\cap$ 240       0xF0       Identity $\equiv$ 241       0xF1       Plus-minus $\pm$ 242       0xF2       Greater-or-equal $\geq$ 243       0xF3       Less-or-equal $\leq$	224	0xE0	Alpha	α
227       0xE3       Pi       π         228       0xE4       Sigma       Σ         229       0xE5       Small Sigma       σ         230       0xE6       Mu       μ         231       0xE7       Tau       τ         232       0xE8       Phi       Φ         233       0xE9       Theta       Θ         234       0xEA       Omega       Ω         235       0xEB       Delta       δ         236       0xEC       Infinity       ∞         237       0xED       Phi (small)       φ         238       0xEE       Epsilon       ε         239       0xEF       Intersection       ∩         240       0xF0       Identity       ≡         241       0xF1       Plus-minus       ±         242       0xF2       Greater-or-equal       ≥         243       0xF3       Less-or-equal       ≤	225	0xE1	Beta	β
228       0xE4       Sigma       Σ         229       0xE5       Small Sigma       σ         230       0xE6       Mu       μ         231       0xE7       Tau       τ         232       0xE8       Phi       Φ         233       0xE9       Theta       Θ         234       0xEA       Omega       Ω         235       0xEB       Delta       δ         236       0xEC       Infinity       ∞         237       0xED       Phi (small)       φ         238       0xEE       Epsilon       ε         239       0xEF       Intersection       ∩         240       0xF0       Identity       ≡         241       0xF1       Plus-minus       ±         242       0xF2       Greater-or-equal       ≥         243       0xF3       Less-or-equal       ≤	226	0xE2	Gamma	Γ
229       0xE5       Small Sigma       σ         230       0xE6       Mu       μ         231       0xE7       Tau       τ         232       0xE8       Phi       Φ         233       0xE9       Theta       Θ         234       0xEA       Omega       Ω         235       0xEB       Delta       δ         236       0xEC       Infinity       ∞         237       0xED       Phi (small)       φ         238       0xEE       Epsilon       ε         239       0xEF       Intersection       ∩         240       0xF0       Identity       ≡         241       0xF1       Plus-minus       ±         242       0xF2       Greater-or-equal       ≥         243       0xF3       Less-or-equal       ≤	227	0xE3	Pi	π
230       0xE6       Mu       μ         231       0xE7       Tau       τ         232       0xE8       Phi       Φ         233       0xE9       Theta       Θ         234       0xEA       Omega       Ω         235       0xEB       Delta       δ         236       0xEC       Infinity       ∞         237       0xED       Phi (small)       φ         238       0xEE       Epsilon       ε         239       0xEF       Intersection       ∩         240       0xF0       Identity       ≡         241       0xF1       Plus-minus       ±         242       0xF2       Greater-or-equal       ≥         243       0xF3       Less-or-equal       ≤	228	0xE4	Sigma	Σ
231       0xE7       Tau       τ         232       0xE8       Phi       Φ         233       0xE9       Theta       Θ         234       0xEA       Omega       Ω         235       0xEB       Delta       δ         236       0xEC       Infinity       ∞         237       0xED       Phi (small)       φ         238       0xEE       Epsilon       ε         239       0xEF       Intersection       ∩         240       0xF0       Identity       ≡         241       0xF1       Plus-minus       ±         242       0xF2       Greater-or-equal       ≥         243       0xF3       Less-or-equal       ≤	229	0xE5	Small Sigma	σ
232       0xE8       Phi       Φ         233       0xE9       Theta       Θ         234       0xEA       Omega       Ω         235       0xEB       Delta       δ         236       0xEC       Infinity       ∞         237       0xED       Phi (small)       φ         238       0xEE       Epsilon       ε         239       0xEF       Intersection       ∩         240       0xF0       Identity       ≡         241       0xF1       Plus-minus       ±         242       0xF2       Greater-or-equal       ≥         243       0xF3       Less-or-equal       ≤	230	0xE6	Mu	μ
233       0xE9       Theta       Θ         234       0xEA       Omega       Ω         235       0xEB       Delta       δ         236       0xEC       Infinity       ∞         237       0xED       Phi (small)       φ         238       0xEE       Epsilon       ε         239       0xEF       Intersection       ∩         240       0xF0       Identity       ≡         241       0xF1       Plus-minus       ±         242       0xF2       Greater-or-equal       ≥         243       0xF3       Less-or-equal       ≤	231	0xE7	Tau	τ
2340xEAOmegaΩ2350xEBDeltaδ2360xECInfinity $\infty$ 2370xEDPhi (small) $\varphi$ 2380xEEEpsilon $\varepsilon$ 2390xEFIntersection $\cap$ 2400xF0Identity $\equiv$ 2410xF1Plus-minus $\pm$ 2420xF2Greater-or-equal $\geq$ 2430xF3Less-or-equal $\leq$	232	0xE8	Phi	Φ
235       0xEB       Delta       δ         236       0xEC       Infinity       ∞         237       0xED       Phi (small)       φ         238       0xEE       Epsilon       ε         239       0xEF       Intersection       ∩         240       0xF0       Identity       ≡         241       0xF1       Plus-minus       ±         242       0xF2       Greater-or-equal       ≥         243       0xF3       Less-or-equal       ≤	233	0xE9	Theta	Θ
2360xECInfinity $\infty$ 2370xEDPhi (small) $φ$ 2380xEEEpsilon $ε$ 2390xEFIntersection $Ω$ 2400xF0Identity $≡$ 2410xF1Plus-minus $±$ 2420xF2Greater-or-equal $≥$ 2430xF3Less-or-equal $≤$	234	0xEA	Omega	Ω
2370xEDPhi (small)φ2380xEEEpsilonε2390xEFIntersection∩2400xF0Identity $\equiv$ 2410xF1Plus-minus $\pm$ 2420xF2Greater-or-equal $\geq$ 2430xF3Less-or-equal $\leq$	235	0xEB	Delta	δ
238       0xEE       Epsilon       ε         239       0xEF       Intersection       ∩         240       0xF0       Identity       ≡         241       0xF1       Plus-minus       ±         242       0xF2       Greater-or-equal       ≥         243       0xF3       Less-or-equal       ≤	236	0xEC	Infinity	∞
239       0xEF       Intersection       ∩         240       0xF0       Identity       ≡         241       0xF1       Plus-minus       ±         242       0xF2       Greater-or-equal       ≥         243       0xF3       Less-or-equal       ≤	237	0xED	Phi (small)	φ
240       0xF0       Identity       ≡         241       0xF1       Plus-minus       ±         242       0xF2       Greater-or-equal       ≥         243       0xF3       Less-or-equal       ≤	238	0xEE	Epsilon	8
241         0xF1         Plus-minus         ±           242         0xF2         Greater-or-equal         ≥           243         0xF3         Less-or-equal         ≤	239	0xEF	Intersection	Λ
242 0xF2 <b>Greater-or-equal</b> ≥ 243 0xF3 <b>Less-or-equal</b> ≤	240	0xF0	Identity	≣
243 0xF3 Less-or-equal ≤	241	0xF1	Plus-minus	±
<del></del>	242	0xF2	Greater-or-equal	<u>&gt;</u>
244 0xF4 Integral Top	243	0xF3	Less-or-equal	<u> </u>
	244	0xF4	Integral Top	ſ

Dec	Hex	Character Name (Common)	Display
245	0xF5	Integral Bottom	J
246	0xF6	Division	÷
247	0xF7	Approximately Equal	<b>≈</b>
248	0xF8	Degree Sign	o
249	0xF9	Bullet (filled)	
250	0xFA	Bullet (small square)	
251	0xFB	Square Root	√
252	0xFC	Small N	n
253	0xFD	Superscript 2	2
254	0xFE	Solid Square	
255	0xFF	Non-breaking Space	(space)

### Key Sections in Code Page 437

- 0x00 0x1F (0-31): Control Characters and Graphical/Dingbat Symbols (e.g., smiling faces, card suits, arrows, musical notes).
- **0x20 0x7E (32-126): Standard ASCII** (numbers, Latin uppercase and lowercase letters, and punctuation).
- **0x7F (127):** A specific graphical character (house symbol).
- 0x80 0xAF (128-175): Extended Latin Characters (accented letters like Ç, ü, é, and currency symbols like £, ¥).
- 0xB0 0xDF (176-223): Box and Line Drawing, and Shading Characters (used to create borders, tables, and graphical elements in text mode). These are the characters that make up your complex grid patterns.
- 0xE0 0xFF (224-255): Mathematical Symbols and Greek Letters (e.g.,  $\alpha$ ,  $\pi$ ,  $\Sigma$ ,  $\pm$ ,  $\div$ ,  $\infty$ ).

# Usage in FPGA Projects

This character set is commonly used in FPGA projects for:

- Text displays on OLED/LCD screens
- Character-based user interfaces
- Retro computing applications
- Educational projects demonstrating character encoding

The 8x8 pixel format makes it ideal for small displays and provides a good balance between readability and memory usage.

#### References

Original IBM PC Character Set

- MS-DOS default codepage
- VGA text mode font basis
- Foundation for many modern character encodings
   c:\Users\xiang\ee2026\_Project\docs\cp437\_reference.md