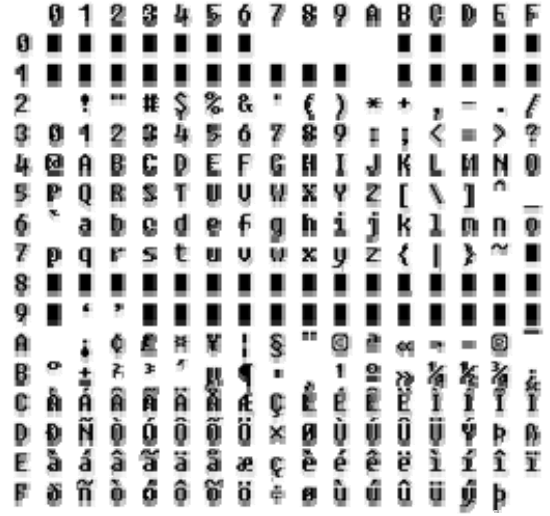
1 ASCII TABLE

Dec	Hex	Char	Dec	Hex	Char	Dec	Hex	Char	Dec	Hex	Char
0	00	Null	32	20	Space	64	40	@	96	60	`
1	01	Start of heading	33	21	!	65	41	A	97	61	a
2	02	Start of text	34	22	"	66	42	B	98	62	b
3	03	End of text	35	23	#	67	43	C	99	63	c
4	04	End of transmit	36	24	$	68	44	D	100	64	d
5	05	Enquiry	37	25	%	69	45	E	101	65	e
6	06	Acknowledge	38	26	&	70	46	F	102	66	f
7	07	Audible bell	39	27	'	71	47	G	103	67	g
8	08	Backspace	40	28	(	72	48	H	104	68	h
9	09	Horizontal tab	41	29	)	73	49	I	105	69	i
10	0A	Line feed	42	2A	*	74	4A	J	106	6A	j
11	0B	Vertical tab	43	2B	+	75	4B	K	107	6B	k
12	0C	Form feed	44	2C	,	76	4C	L	108	6C	l
13	0D	Carriage return	45	2D	-	77	4D	M	109	6D	m
14	0E	Shift out	46	2E	.	78	4E	N	110	6E	n
15	0F	Shift in	47	2F	/	79	4F	O	111	6F	o
16	10	Data link escape	48	30	0	80	50	P	112	70	p
17	11	Device control 1	49	31	1	81	51	Q	113	71	q
18	12	Device control 2	50	32	2	82	52	R	114	72	r
19	13	Device control 3	51	33	3	83	53	S	115	73	s
20	14	Device control 4	52	34	4	84	54	T	116	74	t
21	15	Neg. acknowledge	53	35	5	85	55	U	117	75	u
22	16	Synchronous idle	54	36	6	86	56	V	118	76	v
23	17	End trans. block	55	37	7	87	57	W	119	77	w
24	18	Cancel	56	38	8	88	58	X	120	78	x
25	19	End of medium	57	39	9	89	59	Y	121	79	y
26	1A	Substitution	58	3A	:	90	5A	Z	122	7A	z
27	1B	Escape	59	3B	;	91	5B	[	123	7B	{
28	1C	File separator	60	3C	<	92	5C	\	124	7C	|
29	1D	Group separator	61	3D	=	93	5D	]	125	7D	}
30	1E	Record separator	62	3E	>	94	5E	^	126	7E	~
31	1F	Unit separator	63	3F	?	95	5F	_	127	7F	□

Dec	Hex	Char	Dec	Hex	Char	Dec	Hex	Char	Dec	Hex	Char
128	80	Ç	160	A0	á	192	C0	└	224	E0	α
129	81	ü	161	A1	í	193	C1	┴	225	E1	ß
130	82	é	162	A2	ó	194	C2	┬	226	E2	Γ
131	83	â	163	A3	ú	195	C3	├	227	E3	π
132	84	ä	164	A4	ñ	196	C4	─	228	E4	∑
133	85	à	165	A5	Ñ	197	C5	┼	229	E5	σ
134	86	å	166	A6	ª	198	C6	╞	230	E6	µ
135	87	ç	167	A7	º	199	C7	╟	231	E7	τ
136	88	ê	168	A8	¿	200	C8	╚	232	E8	Φ
137	89	ë	169	A9	⌐	201	C9	╔	233	E9	Θ
138	8A	è	170	AA	¬	202	CA	╩	234	EA	Ω
139	8B	ï	171	AB	½	203	CB	╦	235	EB	δ
140	8C	î	172	AC	¼	204	CC	╠	236	EC	∞
141	8D	ì	173	AD	¡	205	CD	═	237	ED	ø
142	8E	Ä	174	AE	«	206	CE	╬	238	EE	ε
143	8F	Å	175	AF	»	207	CF	╧	239	EF	∩
144	90	É	176	B0	░	208	D0	╨	240	F0	≡
145	91	æ	177	B1	▒	209	D1	╤	241	F1	±
146	92	Æ	178	B2	▓	210	D2	╥	242	F2	≥
147	93	ô	179	B3	│	211	D3	╙	243	F3	≤
148	94	ö	180	B4	┤	212	D4	╘	244	F4	⌠
149	95	ò	181	B5	╡	213	D5	╒	245	F5	⌡
150	96	û	182	B6	╢	214	D6	╓	246	F6	÷
151	97	ù	183	B7	╖	215	D7	╫	247	F7	≈
152	98	ÿ	184	B8	╕	216	D8	╪	248	F8	°
153	99	Ö	185	B9	╣	217	D9	┘	249	F9	∙
154	9A	Ü	186	BA	║	218	DA	┌	250	FA	·
155	9B	¢	187	BB	╗	219	DB	█	251	FB	√
156	9C	£	188	BC	╝	220	DC	▄	252	FC	ⁿ
157	9D	¥	189	BD	╜	221	DD	▌	253	FD	²
158	9E	₧	190	BE	╛	222	DE	▐	254	FE	■
159	9F	ƒ	191	BF	┐	223	DF	▀	255	FF	

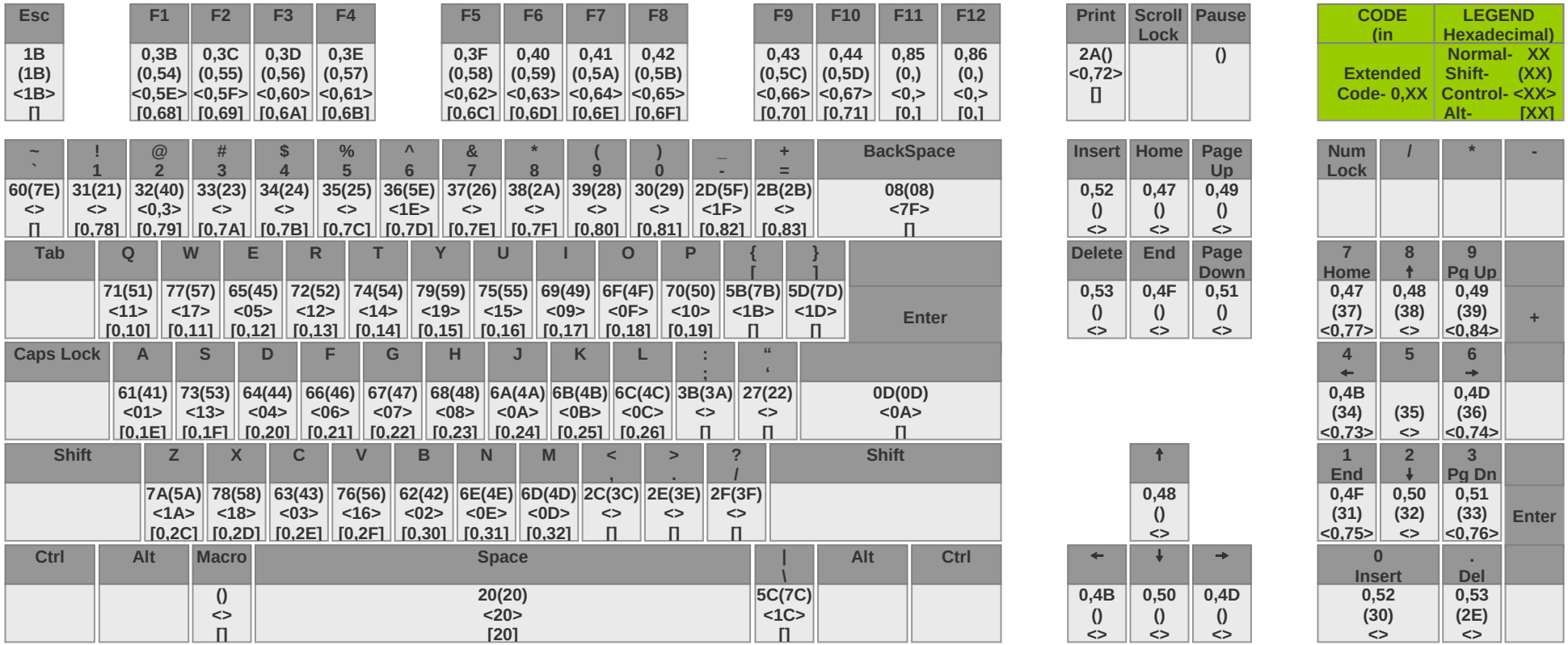
2 ASCII TABLE (DOS)

3 ASCII TABLE (Window)



4 Keyboard Codes

The Diagram below shows the codes that are returned when a key is pressed.
For example, pressing ‘a’ would return 0x61.
If it is an extended key, the code is shown as “0,XX” where XX is the extended code



5 Other References

"Printf" Escape Sequences			
Color	Code	Foregound	Background
Black	0	•	•
Blue	1	•	•
Green	2	•	•
Cyan	3	•	•
Red	4	•	•
Magenta	5	•	•
Brown	6	•	•
Light Grey	7	•	•
Dark Grey	8	•	
Light Blue	9	•	
Light Green	10	•	
Light Cyan	11	•	
Light Red	12	•	
Light Magenta	13	•	
Yellow	14	•	
White	15	•	
Blink	+128	•	

C Numeric Data Types			
Keyword	Varible Type	Range	Storage Required
char	character (for string)	-128 to 127	1 byte
Int	interger	-32,768 to 32,767	2 byte
short int	short integer	-32,768 to 32,767	2 byte
Long	long integer	-2,147,483,648 to 2,147,483,647	4 byte
unsigned char	unsigned character	0 to 255	1 byte
unsigned int	unsigned integer	0 to 65,535	2 byte
unsigned short	unsigned short integer	0 to 65,535	2 byte
unsigned long	unsigned long integer	0 to 4,294,967,295	4 byte
float	single-precision floating point (accurate to 7 digits)	3.4×10^{38} to 3.4×10^{-38}	4 byte
double	double-precision floating point (accurate to 15 digits)	1.7×10^{308} to 1.7×10^{-308}	8 byte

"Printf" Conversion Characters	
Conversion Character	Display Argument (Variable's contents) as
%c	single character
%d	signed decimal integer (int)
%e	signed floating-point value in E notation
%f	signed floating-point value (float)
%g	signed value in %e or %f format, whichever is shorter
%i	signed decimal integer (int)
%o	unsigned octal (base 8) integer (int)
%s	string of text
%u	unsigned decimal integer (int)
%x	unsigned hexadecimal (base 16) integer (int)
%ld	signed decimal integer (long)
%lf	signed floating-point value (double)

"Printf" Escape Sequences	
Sequence	Represents
\a	The speaker beeping
\b	Backspace (move the cursor back, no erase)
\f	Form feed (eject printer page: ankh character on the screen)
\n	Newline, like pressing the Enter key
\r	Carriage return (moves the cursor to the beginning of the line)
\t	Tab
\v	Vertical tab (moves the cursor down a line)
\\	The backslash character
\'	The apostrophe
\"	The double-quote character
\?	The question mark
\0	The "null" byte (backslash-zero)
\O	A character value in octal (base 8)
\xH	A character value in hexadecimal (base 16)

Music Notes Frequency in Hertz							
Notes	Frequency	Notes	Frequency	Notes	Frequency	Notes	Frequency
		c2	65.406	c4	261.63	c6	1046.5
			69.296		277.18		1108.7
0 to 8	Octaves	d2	73.416	d4	293.66	d6	1174.7
c4	middle c		77.782		311.13		1244.5
Treble	>middle c	e2	82.407	e4	329.63	e6	1318.5
Base	<middle c	f2	87.307	f4	349.23	f6	1396.9
			92.499		369.99		1480.0
		g2	97.999	g4	392.00	g6	1568.0
			103.83		415.30		1661.2
a0	27.500	a2	110.00	a4	440.00	a6	1760.0
	29.135		116.54		466.16		1864.7
b0	30.868	b2	123.47	b4	493.88	b6	1975.5
c1	32.703	c3	130.81	c5	523.25	c7	2093.0
	34.648		138.59		554.37		2217.5
d1	36.708	d3	146.83	d5	587.23	d7	2349.3
	38.891		155.56		622.25		2489.0
e1	41.203	e3	164.81	e5	659.26	e7	2637.0
f1	43.654	f3	174.61	f5	698.46	f7	2793.8
	46.249		185.00		739.99		2960.0
g1	48.999	g3	196.00	g5	783.99	g7	3136.0
	51.913		207.65		830.61		3322.4
a1	55.000	a3	220.00	a5	880.00	a7	3520.0
	58.270		233.08		932.33		3729.3
b1	61.735	b3	246.94	b5	987.77	b7	3951.1
						c8	4186.0

Parallel Port Configuration				
Pin	Bit	Direction	Inverted?	Background
2	D0	Data output		
3	D1	Data output		
4	D2	Data output		
5	D3	Data output		
6	D4	Data output		
7	D5	Data output		
8	D6	Data output		
9	D7	Data output		
15	D3	Control in	•	Error
13	D4	Control in		Select out
12	D5	Control in		Printer empty
10	D6	Control in		Acknowledge
11	D7	Control in	•	Printer busy
1	D0	Control out	•	Data strobe
14	D1	Control out	•	Auto feed
16	D2	Control out		Initialize printer
17	D3	Control out	•	Select in
18-25	Gnd			

Port no.	Data Out	Control In	Control Out
1	3BC	3BD	3BE
2	378	379	37A
3	278	279	27A

C programming code for Parallel Port

```
#DEFINE LPT 0x378   //port address
char data;          //data variable
outportb(LPT,data); //output to parallel port
data=inportb(LPT);  //input from parallel port
```

PC Monitor Port (common HD15 connector)			
Pins	Description	Pins	Description
1	Red	9	Key (no pin)
2	Green	10	Ground
3	Blue	11	Monitor sense 0
4	reserved	12	Monitor sense 1
5	reserved	13	Horizontal sync
6	Red return	14	Vertical sync
7	Green return	15	reserved
8	Blue return	http://www.repairfaq.org/REPAIR/F_Pinouts1.html	

Computer Port Information			
Port Range	Description	Port Range	Description
000-00F	DMA Chip 8737	2F8-2FF	COM 2
020-021	8259 PIC	378-37F	Parallel Printer Port
040-043	Timer Chip 8253	3B0-3BF	Monochrome Display
060-063	PPI 8255 (cassette, sound)	3D0-3DF	Color display

080-083	DMA Page register’s	3F0-3F7	Diskette
200-20F	Game I/O Adapter	3F8-3FF	COM 1
278-27F	Reserved		

Computer Interrupt Information

Bios INT	Dos INT	Function no.	Description
			Using Keyboard
	21h	01h	Wait for keyboard input
	21h	08h	Console input without echo
16h		00h	Read keyboard input
16h		01h	Read keyboard status
16h		02h	Return shift flag status
			Controlling the video display
	21h	02h	Display Output
	21h	09h	Display string
10h		00h	Set video mode
10h		0Fh	Read current video mode
10h		02h	Set cursor position
10h		03h	Read current cursor position
10h		0Ah	Write character to screen
10h		09h	Write character/attribute to screen
10h		08h	Write character/attribute from screen
10h		06h	Scroll current page up
			Controlling the Printer
	21h	05h	Printer output
17h		00h	Print character
17h		01h	Initialize printer
17h		02h	Read printer status
			Interrupt Handling (interrupt vector table)
	21h	35h	Get interrupt vector
	21h	25h	Set interrupt vector
			Multitasking
1Ch			Timer tick
			Memory Management
	21h	48h	Allocate memory
	21h	49h	Free allocated memory
	21h	4Ah	Modify allocate memory blocks
			Using the Mouse
Mouse INT	33h	00h	Mouse reset and status
Mouse INT	33h	01h	Show mouse cursor
Mouse INT	33h	02h	Hide mouse cursor
Mouse INT	33h	03h	Get button status and mouse position
	21h	31h	Terminate and stay resident
			Reading and Writing Disk Sectors
13h		00h	Reset diskette system
13h		01h	Read diskette status
13h		02h	Read diskette sector
13h		03h	Write diskette sector
			Directory Functions
	21h	47h	Get current directory
	21h	3Bh	Set current directory
	21h	39h	Create sub-directory
	21h	3Ah	Delete sub-directory
	21h	19h	Get current drive
			Reading Text Files
	21h	3Dh	Open file with handle
	21h	3Fh	Read from file
	21h	3Eh	Close file with handle
			Creating a Text File
	21h	3Ch	Create file
	21h	40h	Write to file
			Accessing an Existing File
	21h	42h	Position file pointer
			Miscellaneous File and Disk Functions
	21h	43h	Get or set file attributes
	21h	56h	Rename file
	21h	57h	Get or set file date and time
	21h	1Ah	Set disk transfer area (DTA)
	21h	1Bh	Get current drive information
	21h	1Ch	Get drive information
	21h	4Eh	Find file
	21h	41h	Delete file
	21h		
	21h		
	21h		
	21h		
	21h		
	21h		
	21h		