

## The Sound Generator

### Sound Generator Commands

**BEEP** Causes the sound generator to "beep" for approximately 1/2 second.  
BEEP

**SOUND *pitch, length*** "Plays" a given *pitch* for the given *length*. *length* ranges from 0 to 255. Dividing length by 50 gives the approximate length in seconds. *pitch* ranges from 0 to 16383, with the smaller values corresponding to higher pitches.  
SOUND 4500,50

**SOUND ON or OFF** Enables or disables "beep" when:

- You're loading from cassette
- The Model 100 is waiting on a carrier signal from the telephone modem lines.

SOUND ON      SOUND OFF

### SOUND Pitch Values Corresponding to Standard Musical notes

Note	Octave				
	1	2	3	4	5
G	12538	6269	3134	1567	83
G#	11836	5918	2959	1479	739
A	11172	5586	2793	1396	698
A#	10544	5272	2636	1318	659
B	9952	4976	2488	1244	62
C	9394	4697	2348	1174	587
C#	8866	4433	2216	1108	554
D	8368	4184	2092	1046	523
D#	7900	3950	1975	967	493
E	7456	3728	1864	932	466
F	7032	3516	1758	879	439
F#	6642	3321	1660	830	415

## ASCII Codes/Characters

Decimal	Hex	Binary	Printed Character	Keyboard Character
0	00	00000000		(PAUSE)
1	01	00000001		(CTRL) A
2	02	00000010		(CTRL) B
3	03	00000011		(CTRL) C
4	04	00000100		(CTRL) D
5	05	00000101		(CTRL) E
6	06	00000110		(CTRL) F
7	07	00000111		(CTRL) G
8	08	00001000		(CTRL) H
9	09	00001001		(CTRL) I
10	0A	00001010		(CTRL) J
11	0B	00001011		(CTRL) K
12	0C	00001100		(CTRL) L
13	0D	00001101		(CTRL) M
14	0E	00001110		(CTRL) N
15	0F	00001111		(CTRL) O
16	10	00010000		(CTRL) P
17	11	00010001		(CTRL) Q
18	12	00010010		(CTRL) R
19	13	00010011		(CTRL) S
20	14	00010100		(CTRL) T
21	15	00010101		(CTRL) U
22	16	00010110		(CTRL) V
23	17	00010111		(CTRL) W
24	18	00011000		(CTRL) X
25	19	00011001		(CTRL) Y
26	1A	00011010		(CTRL) Z

Decimal	Hex	Binary	Printed Character	Keyboard Character
27	1B	00011011		ESC
28	1C	00011100		→
29	1D	00011101		←
30	1E	00011110		↓
31	1F	00011111		↑
32	20	00100000		SPACEBAR
33	21	00100001	!	!
34	22	00100010	"	"
35	23	00100011	#	#
36	24	00100100	\$	\$
37	25	00100101	%	%
38	26	00100110	&	&
39	27	00100111	'	'
40	28	00101000	{	{
41	29	00101001	}	}
42	2A	00101010	*	*
43	2B	00101011	+	+
44	2C	00101100	,	,
45	2D	00101101	-	-
46	2E	00101110	.	.
47	2F	00101111	/	/
48	30	00110000	0	0
49	31	00110001	1	1
50	32	00110010	2	2
51	33	00110011	3	3
52	34	00110100	4	4
53	35	00110101	5	5
54	36	00110110	6	6

Decimal	Hex	Binary	Printed Character	Keyboard Character
55	37	00110111	7	7
56	38	00111000	8	8
57	39	00111001	9	9
58	3A	00111010	:	:
59	3B	00111011	;	;
60	3C	00111100	<	<
61	3D	00111101	=	=
62	3E	00111110	>	>
63	3F	00111111	?	?
64	40	01000000	@	@
65	41	01000001	A	A
66	42	01000010	B	B
67	43	01000011	C	C
68	44	01000100	D	D
69	45	01000101	E	E
70	46	01000110	F	F
71	47	01000111	G	G
72	48	01001000	H	H

\* For uppercase letters A-Z, press (SHIFT) or (CAPS LOCK) before pressing the Keyboard Character.

Decimal	Hex	Binary	Printed Character	Keyboard Character
73	49	01001001	I	I
74	4A	01001010	J	J
75	4B	01001011	K	K
76	4C	01001100	L	L
77	4D	01001101	M	M
78	4E	01001110	N	N
79	4F	01001111	O	O
80	50	01010000	P	P
81	51	01010001	Q	Q
82	52	01010010	R	R
83	53	01010011	S	S
84	54	01010100	T	T
85	55	01010101	U	U
86	56	01010110	V	V
87	57	01010111	W	W
88	58	01011000	X	X
89	59	01011001	Y	Y
90	5A	01011010	Z	Z
91	5B	01011011	[	[
92	5C	01011100	\	(GRAPH) -
93	5D	01011101	]	]
94	5E	01011110	-	-
95	5F	01011111	_	_
96	60	01100000	`	(GRAPH) [
97	61	01100001	a	A

\* For lowercase letters a-z, be sure (CAPS LOCK) is not pressed "down."

Decimal	Hex	Binary	Printed Character	Keyboard Character
98	62	01100010	b	B
99	63	01100011	c	C
100	64	01100100	d	D
101	65	01100101	e	E
102	66	01100110	f	F
103	67	01100111	g	G
104	68	01101000	h	H
105	69	01101001	i	I
106	6A	01101010	j	J
107	6B	01101011	k	K
108	6C	01101100	l	L
109	6D	01101101	m	M
110	6E	01101110	n	N
111	6F	01101111	o	O
112	70	01110000	p	P
113	71	01110001	q	Q
114	72	01110010	r	R
115	73	01110011	s	S
116	74	01110100	t	T
117	75	01110101	u	U
118	76	01110110	v	V
119	77	01110111	w	W
120	78	01111000	x	X
121	79	01111001	y	Y
122	7A	01111010	z	Z
123	7B	01111011	{	(GRAPH) 9
124	7C	01111100		(GRAPH) _
125	7D	01111101	}	(GRAPH) 0

Decimal	Hex	Binary	Printed Character	Keyboard Character
126	7E	01111110	.	(GRAPH) ]
127	7F	01111111		(DEL)
128	80	10000000	☐	(GRAPH) p
129	81	10000001	☐	(GRAPH) m
130	82	10000010	(x	(GRAPH) t
131	83	10000011	☐	(GRAPH) x
132	84	10000100	☐	(GRAPH) c
133	85	10000101	☐	(GRAPH) a
134	86	10000110	☐	(GRAPH) h
135	87	10000111	☐	(GRAPH) t
136	88	10001000	i	(GRAPH) l
137	89	10001001	√	(GRAPH) r
138	8A	10001010	#	(GRAPH) /
139	8B	10001011	Σ	(GRAPH) s
140	8C	10001100	=	(GRAPH) *
141	8D	10001101	±	(GRAPH) =
142	8E	10001110	f	(GRAPH) i
143	8F	10001111	◀	(GRAPH) e
144	90	10010000	☐	(GRAPH) y
145	91	10010001	☐	(GRAPH) u
146	92	10010010	☐	(GRAPH) ;
147	93	10010011	☐	(GRAPH) q
148	94	10010100	☐	(GRAPH) w
149	95	10010101	☐	(GRAPH) b
150	96	10010110	☐	(GRAPH) n
151	97	10010111	☐	(GRAPH) .
152	98	10011000	☐	(GRAPH) o
153	99	10011001	☐	(GRAPH) ,

Decimal	Hex	Binary	Printed Character	Keyboard Character
154	9A	10011010	→	(GRAPH) l
155	9B	10011011	←	(GRAPH) k
156	9C	10011100	⊗	(GRAPH) 2
157	9D	10011101	◊	(GRAPH) 3
158	9E	10011110	♥	(GRAPH) 4
159	9F	10011111	♠	(GRAPH) 5
160	A0	10100000	'	(CODE) '
161	A1	10100001	à	(CODE) x
162	A2	10100010	ç	(CODE) c
163	A3	10100011	£	(GRAPH) 8
164	A4	10100100	'	(CODE) "
165	A5	10100101	μ	(CODE) M
166	A6	10100110	°	(CODE) )
167	A7	10100111	▼	(CODE) _
168	A8	10101000	↑	(CODE) +
169	A9	10101001	☐	(CODE) s
170	AA	10101010	☐	(CODE) R
171	AB	10101011	☐	(CODE) C
172	AC	10101100	¼	(CODE) p
173	AD	10101101	¾	(CODE) :
174	AE	10101110	½	(CODE) /
175	AF	10101111	€	(CODE) 0
176	B0	10110000	¥	(GRAPH) 7

Decimal	Hex	Binary	Printed Character	Keyboard Character
177	B1	10110001	À	(CODE) A
178	B2	10110010	Á	(CODE) O
179	B3	10110011	Â	(CODE) U
180	B4	10110100	ã	(GRAPH) 6
181	B5	10110101	ä	(CODE) [
182	B6	10110110	å	(CODE) a
183	B7	10110111	æ	(CODE) o
184	B8	10111000	ç	(CODE) u
185	B9	10111001	È	(CODE) S
186	BA	10111010	É	(CODE) T
187	BB	10111011	Ê	(CODE) d
188	BC	10111100	Ë	(CODE) ,
189	BD	10111101	Ì	(CODE) v
190	BE	10111110	Í	(CODE) =
191	BF	10111111	Î	(CODE) F
192	C0	11000000	Ï	(CODE) l
193	C1	11000001	Ï	(CODE) 3
194	C2	11000010	Ï	(CODE) 8
195	C3	11000011	Ï	(CODE) 9
196	C4	11000100	Ï	(CODE) 7
197	C5	11000101	Ï	(CODE) -
198	C6	11000110	Ï	(CODE) e
199	C7	11000111	Ï	(CODE) i
200	C8	11001000	Ï	(CODE) q
201	C9	11001001	Ï	(CODE) k
202	CA	11001010	Ï	(CODE) l
203	CB	11001011	Ï	(CODE) j
204	CC	11001100	Ï	(CODE) y

Decimal	Hex	Binary	Printed Character	Keyboard Character
205	CD	11001101	ñ	(CODE) n
206	CE	11001110	ô	(CODE) z
207	CF	11001111	ó	(CODE) .
208	D0	11010000	Ä	(CODE) !
209	D1	11010001	Å	(CODE) #
210	D2	11010010	Ï	(CODE) '
211	D3	11010011	Ï	(CODE) (
212	D4	11010100	Ï	(CODE) &
213	D5	11010101	Ï	(CODE)
214	D6	11010110	Ï	(CODE) E
215	D7	11010111	Ï	(CODE) D
216	D8	11011000	Ä	(CODE) Q
217	D9	11011001	Ï	(CODE) K
218	DA	11011010	Ï	(CODE) L
219	DB	11011011	Ï	(CODE) J
220	DC	11011100	Ï	(CODE) Y
221	DD	11011101	Ï	(CODE) <
222	DE	11011110	Ï	(CODE) V
223	DF	11011111	Ä	(CODE) X
224	ED	11100000		(GRAPH) Z
225	E1	11100001	■ (upper left)	(GRAPH) !
226	E2	11100010	■ (upper right)	(GRAPH) @
227	E3	11100011	■ (lower left)	(GRAPH) #
228	E4	11100100	■ (lower right)	(GRAPH) \$
229	E5	11100101	■	(GRAPH) %

Decimal	Hex	Binary	Printed Character	Keyboard Character
230	E6	11100110	▀	(GRAPH) ^
231	E7	11100111	▁ (upper)	(GRAPH) Q
232	E8	11101000	▂ (lower)	(GRAPH) W
233	E9	11101001	▃ (left)	(GRAPH) E
234	EA	11101010	▄ (right)	(GRAPH) R
235	EB	11101011	▅	(GRAPH) A
236	EC	11101100	▆	(GRAPH) S
237	ED	11101101	▇	(GRAPH) D
238	EE	11101110	█	(GRAPH) F
239	EF	11101111	▉	(GRAPH) X
240	F0	11110000	▊	(GRAPH) U
241	F1	11110001	▋	(GRAPH) P
242	F2	11110010	▌	(GRAPH) O
243	F3	11110011	▍	(GRAPH) I
244	F4	11110100	▎	(GRAPH) J
245	F5	11110101	▏	(GRAPH) :
246	F6	11110110	▐	(GRAPH) M
247	F7	11110111	░	(GRAPH) >
248	F8	11111000	▒	(GRAPH) <
249	F9	11111001	▓	(GRAPH) L
250	FA	11111010	▔	(GRAPH) K
251	FB	11111011	▕	(GRAPH) H
252	FC	11111100	▖	(GRAPH) T
253	FD	11111101	▗	(GRAPH) G
254	FE	11111110	▘	(GRAPH) Y
255	FF	11111111	▙	(GRAPH) C

## Model 100 BASIC Error Codes

Code	Message	Meaning
1	NF	NEXT without FOR.
2	SN	Syntax Error.
3	RG	RETURN without GOSUB.
4	OD	Out of Data.
5	FC	Illegal function call.
6	OV	Overflow.
7	OM	Out of Memory.
8	UL	Undefined line.
9	BS	Bad Subscript.
10	DD	Doubly Dimensioned Array.
11	/0	Division by Zero.
12	ID	Illegal Direct.
13	TM	Type Mismatch.
14	OS	Out of String Space.
15	LS	String Too Long.
16	ST	String Formula Too Complex.
17	CN	Can't Continue.
18	IO	Error.
19	NR	No RESUME.
20	RW	RESUME Without Error.
21	UE	Undefined Error.
22	MO	Missing Operand.
23-49	UE	Undefined Error.
50	IE	Undefined Error.
51	BN	Bad File Number.
52	FF	File Not Found.
53	AO	Already Open.
54	EF	Input Past End of File.
55	NM	Bad file name.
56	DS	Direct Statement in File.
57	FL	Undefined error.
58	CF	File Not Open.
59-255	UE	Undefined Error.