Reference

OPCODE	ALIAS	DESCRIPTION
BRK	BREAK	Break
LIT	LITERAL	Pushes next byte or label address in memory to the Top Of the Stack (TOS).
POP		Pop last element from stack
NIP		Nip
INC	INCREMENT	Increment by 1
DEC	DECREMENT	Decrement by 1
SWP	SWAP	Swap
ROT	ROTATE	Rotate
DUP	DUPLICATE	Duplicate
OVR	OVER	Over
EQU	=	Equals
NEQ	!=	Not Equals
GTH	>	Greater Than
LTH	<	Lesser Than
JMP	JUMP	Go to/Jump
JCN	IF	If/Conditional Jump
JSR	CALL	Call/Jump Stash Return
STH	STASH	Stash
LDA	LOAD	Load from absolute address
STA	STORE	Store at absolute address
DEI	READ	Read (from Console/input)
DEO	WRITE	Write (to Console/output)
DRW	DRAW, PIXEL	Draw (pixel to Screen/display)
ADD	+	Add
SUB	-	Substract
MUL	*	Multiply
DIV	/	Divide
AND	&	Logical And
ORA	OR, |	Logical Or
EOR	XOR, ^	Logical Exclusive Or
SFT	SHIFT	Logical Shift
NOT	!	Logical Not

Keep mode	The **keep** mode does not consume elements from the stack.
Return mode	The **return** mode uses the return stack (**rst**) instead of the working stack (**wst**) to operate.
Mixed modes	The **keep** and **return** modes can be mixed, for example: **DUPkr** or **DUPrk** would copy a byte from the top of the return stack without consuming its input (copy twice).

(Dedicated to my beloved daughter: **Lexi <3**)

Memory

#	CODE	#	CODE	#	CODE	#	CODE	#	CODE	#	CODE	#	CODE	#	CODE
00		20		40		60		80		A0		C0		E0	
01		21		41		61		81		A1		C1		E1	
02		22		42		62		82		A2		C2		E2	
03		23		43		63		83		A3		C3		E3	
04		24		44		64		84		A4		C4		E4	
05		25		45		65		85		A5		C5		E5	
06		26		46		66		86		A6		C6		E6	
07		27		47		67		87		A7		C7		E7	
08		28		48		68		88		A8		C8		E8	
09		29		49		69		89		A9		C9		E9	
0a		2A		4A		6A		8A		AA		CA		EA	
0b		2B		4B		6B		8B		AB		CB		EB	
0c		2C		4C		6C		8C		AC		CC		EC	
0d		2D		4D		6D		8D		AD		CD		ED	
0e		2E		4E		6E		8E		AE		CE		EE	
0f		2F		4F		6F		8F		AF		CF		EF	
10		30		50		70		90		B0		D0		F0	
11		31		51		71		91		B1		D1		F1	
12		32		52		72		92		B2		D2		F2	
13		33		53		73		93		B3		D3		F3	
14		34		54		74		94		B4		D4		F4	
15		35		55		75		95		B5		D5		F5	
16		36		56		76		96		B6		D6		F6	
17		37		57		77		97		B7		D7		F7	
18		38		58		78		98		B8		D8		F8	
19		39		59		79		99		B9		D9		F9	
1A		3A		5A		7A		9A		BA		DA		FA	
1B		3B		5B		7B		9B		BB		DB		FB	
1C		3C		5C		7C		9C		BC		DC		FC	
1D		3D		5D		7D		9D		BD		DD		FD	
1E		3E		5E		7E		9E		BE		DE		FE	
1F		3F		5F		7F		9F		BF		DF		FF	

Stacks

#	WORKING STACK
00	
01	
02	
03	
04	
05	
06	
07	
08	
09	
0a	
0b	
0c	
0d	
0e	
0f	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
1A	
1B	
1C	
1D	
1E	
1F	

#	RETURN STACK
00	
01	
02	
03	
04	
05	
06	
07	
08	
09	
0a	
0b	
0c	
0d	
0e	
0f	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
1A	
1B	
1C	
1D	
1E	
1F	

Fibonacci Number

#	CODE	#	CODE	#	CODE	#	CODE	#	CODE	#	CODE	#	CODE	#	CODE
00	LIT	20	-	40		60		80		A0		C0		E0	
01	02	21	LIT	41		61		81		A1		C1		E1	
02	LIT	22	fib	42		62		82		A2		C2		E2	
03	fib	23	CALL	43		63		83		A3		C3		E3	
04	CALL	24	+	44		64		84		A4		C4		E4	
05	BREAK	25	@end RETURN	45		65		85		A5		C5		E5	
06	@fib COPYk	26		46		66		86		A6		C6		E6	
07	LIT	27		47		67		87		A7		C7		E7	
08	01	28		48		68		88		A8		C8		E8	
09	=	29		49		69		89		A9		C9		E9	
0a	SWAP	2A		4A		6A		8A		AA		CA		EA	
0b	LIT	2B		4B		6B		8B		AB		CB		EB	
0c	00	2C		4C		6C		8C		AC		CC		EC	
0d	=	2D		4D		6D		8D		AD		CD		ED	
0e	OR	2E		4E		6E		8E		AE		CE		EE	
0f	NOT	2F		4F		6F		8F		AF		CF		EF	
10	LIT	30		50		70		90		B0		D0		F0	
11	recurse	31		51		71		91		B1		D1		F1	
12	IF	32		52		72		92		B2		D2		F2	
13	LIT	33		53		73		93		B3		D3		F3	
14	end	34		54		74		94		B4		D4		F4	
15	JUMP	35		55		75		95		B5		D5		F5	
16	@recurse COPY	36		56		76		96		B6		D6		F6	
17	LIT	37		57		77		97		B7		D7		F7	
18	01	38		58		78		98		B8		D8		F8	
19	-	39		59		79		99		B9		D9		F9	
1A	LIT	3A		5A		7A		9A		BA		DA		FA	
1B	fib	3B		5B		7B		9B		BB		DB		FB	
1C	CALL	3C		5C		7C		9C		BC		DC		FC	
1D	SWAP	3D		5D		7D		9D		BD		DD		FD	
1E	LIT	3E		5E		7E		9E		BE		DE		FE	
1F	02	3F		5F		7F		9F		BF		DF		FF	

Fibonacci Sequence

#	WORKING STACK
00	00
01	01
02	01
03	02
04	03
05	05
06	08
07	0D
08	15
09	22
0a	37
0b	59
0c	90
0d	E9
0e	
0f	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
1A	
1B	
1C	
1D	
1E	
1F	

#	RETURN STACK
00	
01	
02	
03	
04	
05	
06	
07	
08	
09	
0a	
0b	
0c	
0d	
0e	
0f	
10	
11	
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14	
15	
16	
17	
18	
19	
1A	
1B	
1C	
1D	
1E	
1F	

Cubic Sequence

#	WORKING STACK
00	01
01	08
02	1B
03	40
04	7D
05	D8
06	
07	
08	
09	
0a	
0b	
0c	
0d	
0e	
0f	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
1A	
1B	
1C	
1D	
1E	
1F	

#	RETURN STACK
00	
01	
02	
03	
04	
05	
06	
07	
08	
09	
0a	
0b	
0c	
0d	
0e	
0f	
10	
11	
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13	
14	
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16	
17	
18	
19	
1A	
1B	
1C	
1D	
1E	
1F	

Arithmetic Sequence

#	WORKING STACK
00	01
01	04
02	07
03	0a
04	0d
05	10
06	13
07	16
08	19
09	
0a	
0b	
0c	
0d	
0e	
0f	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
1A	
1B	
1C	
1D	
1E	
1F	

#	RETURN STACK
00	
01	
02	
03	
04	
05	
06	
07	
08	
09	
0a	
0b	
0c	
0d	
0e	
0f	
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14	
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16	
17	
18	
19	
1A	
1B	
1C	
1D	
1E	
1F	

Geometric Sequence

#	WORKING STACK
00	01
01	03
02	09
03	1B
04	51
05	F3
06	
07	
08	
09	
0a	
0b	
0c	
0d	
0e	
0f	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
1A	
1B	
1C	
1D	
1E	
1F	

#	RETURN STACK
00	
01	
02	
03	
04	
05	
06	
07	
08	
09	
0a	
0b	
0c	
0d	
0e	
0f	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
1A	
1B	
1C	
1D	
1E	
1F	

Square Sequence

#	WORKING STACK
00	00
01	01
02	04
03	09
04	10
05	19
06	24
07	31
08	40
09	51
0a	
0b	
0c	
0d	
0e	
0f	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
1A	
1B	
1C	
1D	
1E	
1F	

#	RETURN STACK
00	
01	
02	
03	
04	
05	
06	
07	
08	
09	
0a	
0b	
0c	
0d	
0e	
0f	
10	
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13	
14	
15	
16	
17	
18	
19	
1A	
1B	
1C	
1D	
1E	
1F	

Triangular Sequence

#	WORKING STACK
00	01
01	03
02	06
03	0A
04	0F
05	15
06	1C
07	24
08	2D
09	
0a	
0b	
0c	
0d	
0e	
0f	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
1A	
1B	
1C	
1D	
1E	
1F	

#	RETURN STACK
00	
01	
02	
03	
04	
05	
06	
07	
08	
09	
0a	
0b	
0c	
0d	
0e	
0f	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
1A	
1B	
1C	
1D	
1E	
1F	

Console

Input

Output

Hello World

Input															

Output															
H	e	l	l	o		W	o	r	l	d	!				

Capitalize Input

Input														
M	y		d	o	g		s	t	e	p	p	e	d		o
n		a		b	e	e	.								
Output															
M	Y		D	O	G		S	T	E	P	P	E	D		O
N		A		B	E	E	.								

Screen/display

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F	X
00																	
01																	
02																	
03																	
04																	
05																	
06																	
07																	
08																	
09																	
0A																	
0B																	
0C																	
0D																	
0E																	
0F																	
Y																	

Display a Pixel

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F	X
00	■																
01																	
02																	
03																	
04																	
05																	
06																	
07																	
08																	
09																	
0A																	
0B																	
0C																	
0D																	
0E																	
0F																	
Y																	

Display Several Pixels

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F	X
00	■	■						■	■						■	■	
01	■	■						■	■						■	■	
02																	
03																	
04																	
05																	
06																	
07	■	■						■	■						■	■	
08	■	■						■	■						■	■	
09																	
0A																	
0B																	
0C																	
0D																	
0E	■	■						■	■						■	■	
0F	■	■						■	■						■	■	
Y																	

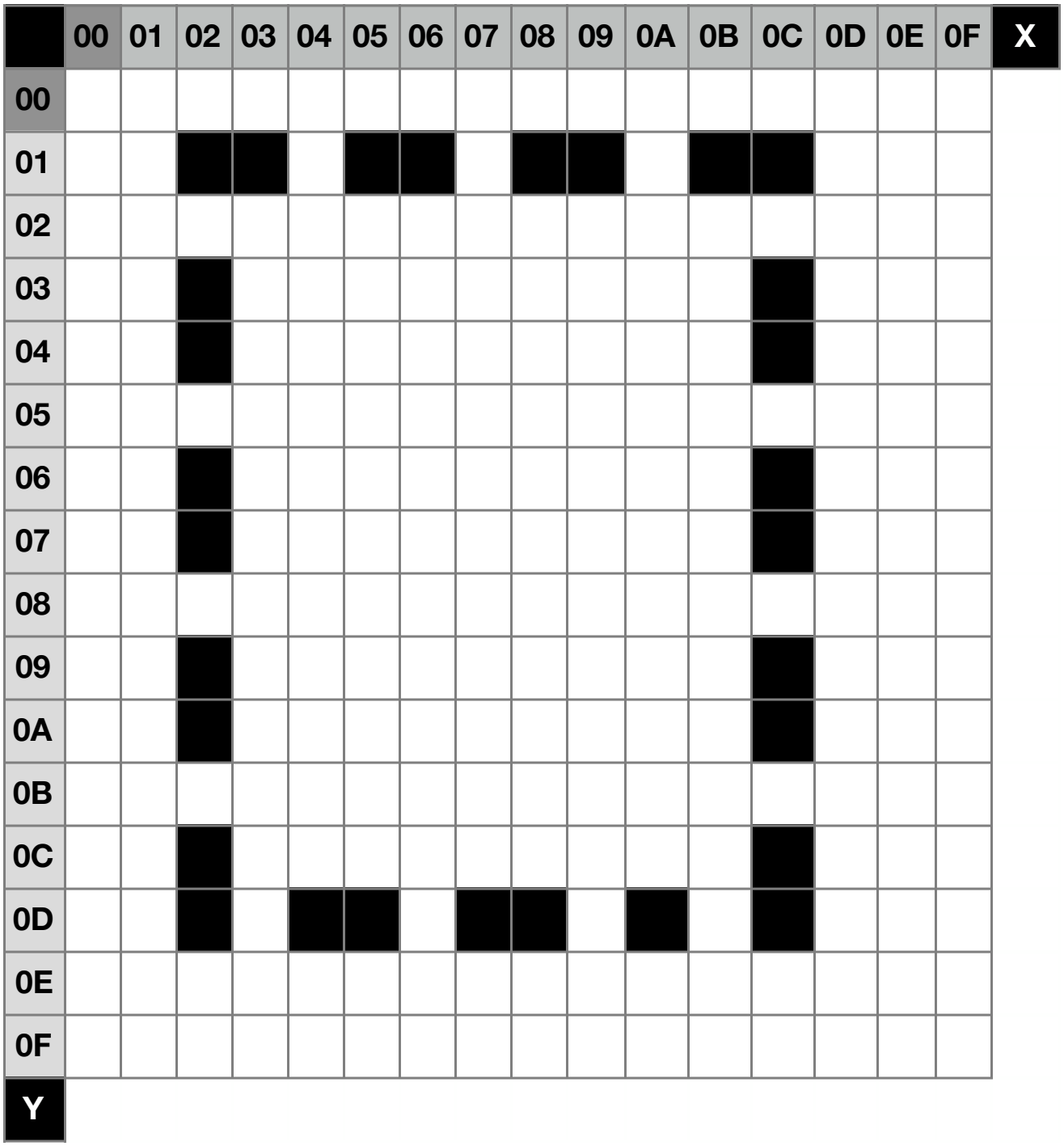
Horizontal Line

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F	X
00																	
01		■	■	■	■	■											
02																	
03																	
04																	
05																	
06																	
07																	
08																	
09																	
0A																	
0B																	
0C																	
0D																	
0E																	
0F																	
Y																	

Vertical Line

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F	X
00																	
01		■															
02		■															
03		■															
04		■															
05		■															
06																	
07																	
08																	
09																	
0A																	
0B																	
0C																	
0D																	
0E																	
0F																	
Y																	

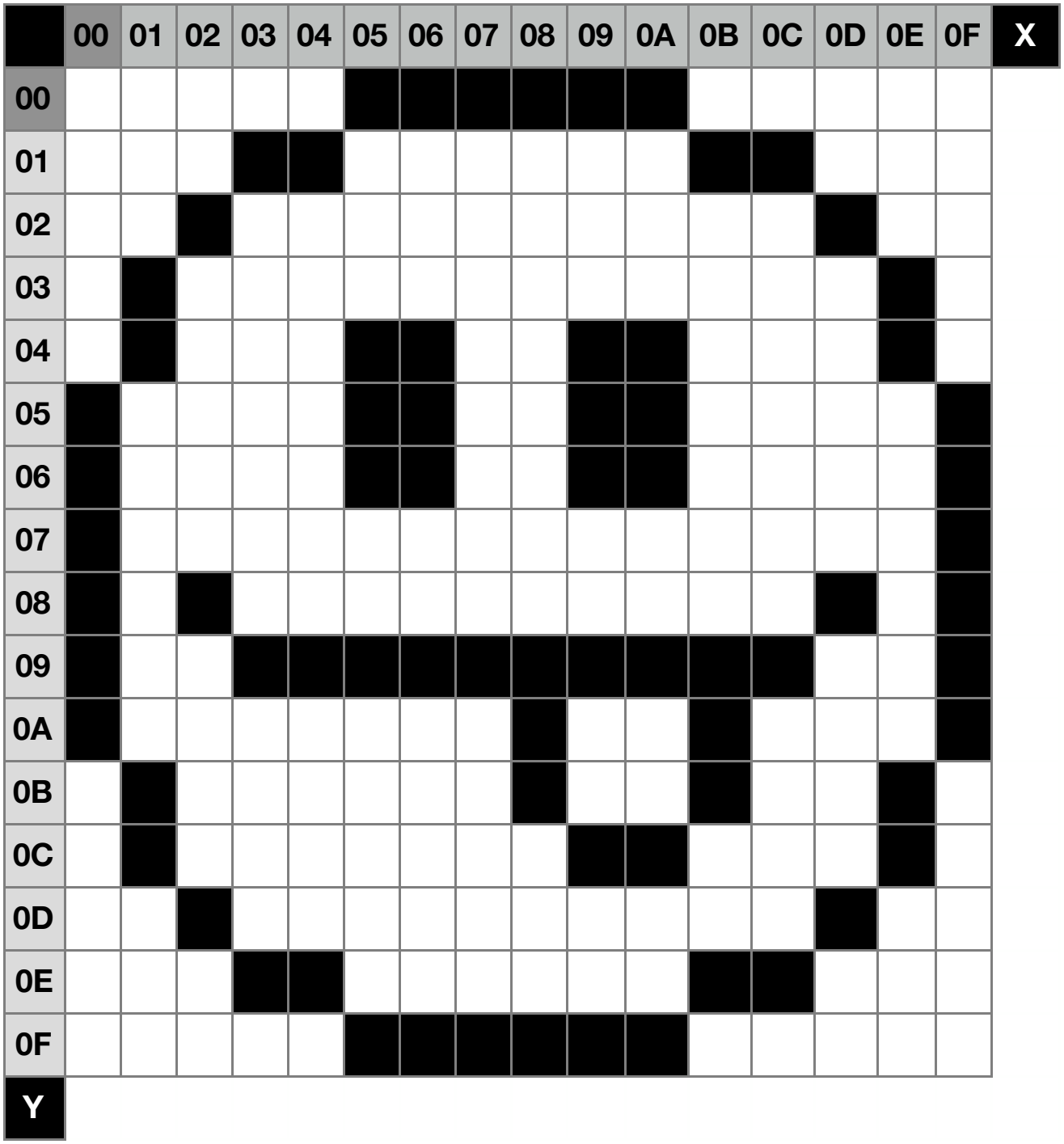
Dotted Lines



Board Pattern

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F	X
00	■	■			■	■			■	■			■	■			
01	■	■			■	■			■	■			■	■			
02			■	■			■	■			■	■			■	■	
03			■	■			■	■			■	■			■	■	
04	■	■			■	■			■	■			■	■			
05	■	■			■	■			■	■			■	■			
06			■	■			■	■			■	■			■	■	
07			■	■			■	■			■	■			■	■	
08	■	■			■	■			■	■			■	■			
09	■	■			■	■			■	■			■	■			
0A			■	■			■	■			■	■			■	■	
0B			■	■			■	■			■	■			■	■	
0C	■	■			■	■			■	■			■	■			
0D	■	■			■	■			■	■			■	■			
0E			■	■			■	■			■	■			■	■	
0F			■	■			■	■			■	■			■	■	
Y																	

Smiley


00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F X
00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F
Y