A	0 – –	0 0 0	A
B	1 – –	0 0 1	B
X	2 – –	0 0 2	X
ADD	– 0 –	0 0 3	P
SUB	– 1 –	2 0 0	OUTPUT
LOAD	– 2 –	3 7 7	INPUT
STORE	– 3 –		
OR A	3 0 –		
NOOP	3 1 –		
AND A	3 2 –		
LNEG A	3 3 –		
IMMED	– – 3		
MEMORY	– – 4		
INDIRECT	– – 5		
INDEXED	– – 6		
IND/XED	– – 7		
A	0 – –		
B	1 – –		
X	2 – –		
UNC	3 – –		
JPD	– 4 –		
JPI	– 5 –		
JMD	– 6 –		
JMI	– 7 –		
≠0	– – 3		
=0	– – 4		
<0	– – 5		
≥0	– – 6		
>0	– – 7		
SET 0	0 B 2		
SET 1	1 B 2		
SKIP 0	2 B 2		
SKIP 1	3 B 2		
B: BIT POSITION			
RT SFT	0 – 1		
RT ROT	1 – 1		
LFT SFT	2 – 1		
LFT ROT	3 – 1		
1 PLC	– 1 –		
2 PLC	– 2 –		
3 PLC	– 3 –		
4 PLC	– 0 –		
B REG	+ 4		
NOOP	2 0 0		
HALT	0 0 0		
OF B0			
CA B1			
A	2 0 1		
B	2 0 2		
X	2 0 3		

PROGRAM HI-LO
VERSION 1 REV 1 DATE 19/12/2019
PROGRAMMER C. PARMIGIANI
NOTES: At start, push B7 button 3 times to generate a pseudorandom number. input number and press start.
LLLLL → YOUR GUESS IS TOO LOW >>>

LOC	DATA	SYMBOLIC ADDRESS	CONTENTS	COMMENTS
003	033			Prog. starts at 033
004	103	COUNT	ADD B +1	ADD B Value = 1
005	001			
006	372		SKP 1 bit 7 (377)	
007	377			
010	344		JPD UNC COUNT	
011	004			
012	213		SUB X C=1	
013	001			
014	244		JPD X=0 HAVE NUM	
015	027			
016	371		ROTL B3	
017	072	CLEAR	SET 0 B7 (377)	
020	377			
021	272		SKP 0 Bit 7 (377)	
022	377			
023	344		JPD UNC CLEAR	
024	017			
025	344		JPD UNC COUNT	
026	004			
027	134	HAVE NUM	STORE B (204)	
030	204			
031	344		JPD UNC DIV	
032	101			
033	223	START	LOAD X C=3	
034	003			
035	344		JPD UNC CLEAR	
036	017			
037	023	PLAY	LOAD A with 0	
040	000			
041	033		STORE B (377)	clear input
042	377			

taken from "laboratory exercises in KENBAK-1 COMPUTER Exercise 30-3, page 154

WS1

A	0 – –	0 0 0	A
B	1 – –	0 0 1	B
X	2 – –	0 0 2	X
ADD	– 0 –	0 0 3	P
SUB	– 1 –	2 0 0	OUTPUT
LOAD	– 2 –	3 7 7	INPUT
STORE	– 3 –		
OR A	3 0 –		
NOOP	3 1 –		
AND A	3 2 –		
LNEG A	3 3 –		
IMMED	– – 3		
MEMORY	– – 4		
INDIRECT	– – 5		
INDEXED	– – 6		
IND/XED	– – 7		
A	0 – –		
B	1 – –		
X	2 – –		
UNC	3 – –		
JPD	– 4 –		
JPI	– 5 –		
JMD	– 6 –		
JMI	– 7 –		
≠0	– – 3		
=0	– – 4		
<0	– – 5		
≥0	– – 6		
>0	– – 7		
SET 0	0 B 2		
SET 1	1 B 2		
SKIP 0	2 B 2		
SKIP 1	3 B 2		
B: BIT POSITION			
RT SFT	0 – 1		
RT ROT	1 – 1		
LFT SFT	2 – 1		
LFT ROT	3 – 1		
1 PLC	– 1 –		
2 PLC	– 2 –		
3 PLC	– 3 –		
4 PLC	– 0 –		
B REG	+ 4		
NOOP	2 0 0		
HALT	0 0 0		
OF B0			
CA B1			
A	2 0 1		
B	2 0 2		
X	2 0 3		

PROGRAM HI-LO
VERSION 1 REV 1 DATE 19/12/2019
PROGRAMMER C. PARMIGIANI
NOTES: LLLLLLLL -> your guess is too HIGH
All lights on -> you win!

LOC	DATA	SYMBOLIC ADDRESS	CONTENTS	COMMENTS
043	000			
044	024		LOAD A (377)	Read input from switches
045	377			
046	014		SUB A (204)	(204) contains the number.
047	204			
050	044		JPD ZERO WIN	
051	060			
052	045		JPD LOW	<0
053	065			
054	047		JPD >0 HIGH	
055	073			
056	344		JPD UNC PLAY	
057	037			
060	023	WIN	LOAD A VALUE 377	-> All LEDS on = WIN!
061	377			
062	034		STORE A (200)	-> print to output
063	200			
064	000		NOOP	ENDGAME
065	023	LOW	LOAD A VALUE 360	-> LLLLLLLL
066	360			
067	034		STORE A (200)	-> light up 4 leftmost LEDs
070	200			
071	344		JPD UNC PLAY	
072	037			
073	023	HIGH	LOAD A VALUE 017	-> LLLLLLLL
074	017			
075	034		STORE A (200)	-> light up 4 rightmost LEDs
076	200			
077	344		JPD UNC PLAY	
100	037			
101	051	DIV	B SHIFT R	Divide by 2 pseudo random number
102	134		STORE B (204)	

WS1

A	0 – –	0 0 0	A
B	1 – –	0 0 1	B
X	2 – –	0 0 2	X
ADD	– 0 –	0 0 3	P
SUB	– 1 –	2 0 0	OUTPUT
LOAD	– 2 –	3 7 7	INPUT
STORE	– 3 –		
OR A	3 0 –		
NOOP	3 1 –		
AND A	3 2 –		
LNEG A	3 3 –		
IMMED	– – 3		
MEMORY	– – 4		
INDIRECT	– – 5		
INDEXED	– – 6		
IND/XED	– – 7		
A	0 – –		
B	1 – –		
X	2 – –		
UNC	3 – –		
JPD	– 4 –		
JPI	– 5 –		
JMD	– 6 –		
JMI	– 7 –		
≠0	– – 3		
=0	– – 4		
<0	– – 5		
≥0	– – 6		
>0	– – 7		
SET 0	0 B 2		
SET 1	1 B 2		
SKIP 0	2 B 2		
SKIP 1	3 B 2		
B: BIT POSITION			
RT SFT	0 – 1		
RT ROT	1 – 1		
LFT SFT	2 – 1		
LFT ROT	3 – 1		
1 PLC	– 1 –		
2 PLC	– 2 –		
3 PLC	– 3 –		
4 PLC	– 0 –		
B REG	+ 4		
NOOP	2 0 0		
HALT	0 0 0		
OF B0			
CA B1			
A	2 0 1		
B	2 0 2		
X	2 0 3		

PROGRAM HI-LO
VERSION 1 REV 1 DATE 19/12/2019
PROGRAMMER C. PARMIGIANI
NOTES: see previous sheets.
RESET P to 033 to play again:
003 033

LOC	DATA	SYMBOLIC ADDRESS	CONTENTS	COMMENTS
103	204			
104	344		JPD UNC PLAY	
105	037			

WS1