

PINBALL MACHINE

This game allows multiple scoring for 5 balls. The balls may be controlled with 4 flippers and tilting is also allowed. As the ball scores, the score is flashed and the running total is displayed. When the ball falls, the display blinks zero. New balls may be set up and played until the 5th ball falls; at that time the total score for the game is displayed as a negative number.

NOTE:

On very rare occasions, the machine will overflow ($\theta=90^\circ...$). In that event, store some other seed in R_2 or start a new game.

This program is adapted from HP-65 Users' Library program #03458A by Peter C. Wang.

SOLUTION:

```

0.32147 ST02 * Initialize
B XXXX Use flipper [1]
200. *** Total score
D XXXX [3]
      XXXX Flashing 0-Ball 1 falls
RC I XXXX 4 balls left
  4. ***

C XXXX [2]
500. *** Score=300,total=500
C XXXX [2]
1000. *** Total
B XXXX [1]
      XXXX Flashing 0-Ball 2 falls
RC I XXXX 3 Balls Left
  3. ***

E XXXX [4]
2100. ***
C XXXX
2700. ***
B XXXX
3300. ***
B XXXX
8000. ***
E XXXX
8800. ***
B XXXX
8900. ***
C XXXX
9400. ***
D XXXX
11300. ***
E XXXX * To reproduce this
12000. *** example, store 0.32147
E XXXX in R2. When playing
12800. *** follow user
E XXXX instruction 2.
12800. ***
E XXXX
15500. ***
E XXXX
16600. ***
C XXXX
26200. ***

```

SOLUTION:

D ~~XXXX~~
 26400. ***
 B ~~XXXX~~
 27200. *** Score=800, Total=27,200
 D ~~XXXX~~
 27300. ***
 B ~~XXXX~~
 27800. ***
 E ~~XXXX~~
 28600. ***
 D ~~XXXX~~
 29500. ***
 B ~~XXXX~~

Flashing Ø-Ball 3 falls

RC I ~~XXXX~~
 2. *** 2 balls left

D ~~XXXX~~

RC I ~~XXXX~~
 1. *** 1 ball left

C ~~XXXX~~

29500. ***

D ~~XXXX~~

30000. ***

B ~~XXXX~~

30900. ***

E ~~XXXX~~

31000. ***

B ~~XXXX~~

32200. ***

B ~~XXXX~~

32700. ***

D ~~XXXX~~

39800. ***

C ~~XXXX~~

39800. ***

C ~~XXXX~~

40200. ***

D ~~XXXX~~

40900. ***

C ~~XXXX~~

-40900. *** Last ball falls, total=

40,900

Program Listings

9

01 *LBL0 LBL A	Initialize	50 ST02	
02 CLRG		51 RCL4	
03 1		52 RCL7	$\theta > 85^\circ?$
04 ST02		53 X $\neq$ Y?	Ball falls(tan θ too large)
05 .		54 GT08	$0 < \tan\theta < 11.43$
06 9		55 RCL2	
07 8		56 1	
08 5		57 0	
09 3		58 x	
10 ST03		59 INT	
11 EEX		60 RCL5	"round" to 100's
12 2		61 x	Σ scores
13 ST05		62 ST+1	Display score
14 8		63 PSE	
15 5		64 RCL1	Display total
16 ST07		65 R/S	
17 5		66 *LBL8	Reduce # of balls
18 ST00 STO I	i=# of balls=5	67 DSZ	Indicate fall of
19 FIX0		68 GT09	ball
20 *LBL5	tilting operation	69 RCL1	
21 RCL3	$(.9853)^n \rightarrow R_2$	70 CLRG	
22 STx2	n=#of loops	71 CHS	Display game total
23 GT05		72 R/S	as a negative no.
24 *LBL1 LBL B		73 *LBL9	
25 3	39=k for flipper[1]	74 0	Blinking zero
26 9		75 PSE	
27 GT04 GTO E		76 GT09	
28 *LBL2 LBL C	53=k for flipper[2]	77 R/S	
29 5			
30 3			
31 GT04 GTO E			
32 *LBL3 LBL D			
33 RCL7	85=k for flipper[3]		
34 *LBL4 LBL E			
35 RCL2			
36 RCL7	lastx = k for		
37 x	flipper [4]		
38 +			
39 RCL3			
40 Yx	(85) $R_2 + K$		
41 RCL3			
42 x			
43 X ²			
44 FRC			
45 RCL5			
46 x			
47 ST04	θ		
48 TAN			
49 ABS	$ \tan\theta $		

REGISTERS

1 i=# of balls	2 Σ Scores	3 Seed	4 .9853	5 0	6 100
7 85	8	9	10	11	12
13	14	15	16	17	18
19	20	21	22	23	24
25	26	27	28	29	