00321D

Program Description I

Program Description, Equations, Variables For those familar with pinball games, the scoring items in this game will not be unknown to them. However, for the rest of us, a little explaination is in order, especially the way HP-97/67 indicates the scores.

In this game, there are 8 different devices that affect scoring, somtimes producing increased scoring on other items, and will be referred to by name, as on a real machine. Each scoring device is given a code number and will be displayed to the right of the decimal point during a double pause, with the score just made on that device, to the left of the point. Device "1" is actually two star roll-overs (circular buttons at the top of the game board), which alternately set the display from 1 place to 9 places and back again. When set to 9 places (a lot of zeros showing) devices #'s 2, 3, 4, 5 & 6 will score 10 times more than their normal amounts as described below. Also, each time the "ball" rolls over device 1, 10 points are added to the players score. Device "2" is 2 top roll over slots, which either score 10 or 100, depending on whether the SPECIAL (DSP 9) is on. Devices # "3" are two mushroom or 'thumper-bumpers'. When the ball strikes these, it can bounce between them, up to 10 times, thus totaling as much as 1000 or as little a 100 when struck. With the SPECIAL lit, the amount is multiplied by 10. Device "4" is a spinner gate, which can spin from 1 to 25 revolutions, scoring 50 or 500 points per spin, again depending on the SPECIAL being lit of not. Devices number "5" are kick-out holes, where the ball drops in and is then kicked back out, scoring 50 or 500. Devices # "6" are two Out-Hole Bonus Advances, which add 1000 points to the Out Bonus, and add an immediate 10 or 100 to the players score. Device "7" consists of 5 Drop Targets. Each time a ball strikes device 7, a target is "dropped" and 10 points are scored. If device 7 is struck 5 times (all targets down) the player gets 100 or 1000 points to score, an extra ball, and all targets are reset, to try again. Device "8" is merely two sling shot bumpers and scores 10 points each time they are struck. When a zero shows up, the ball has dropped out through the Out-Hole, and all the Bonus points are added, 1000 at a time, --(cont. on next page)

Operating Limits and Warnings This program is ment to be left running during play, utilizing the active keyboard, during the pause mode, to perform the operations. Should, at any time, the user accidently jam (halt) a running program by inadvertantly pressing a key, or pressing in a responce too late, the results will usually be a loss of points when R/S is pressed to restart the game. All accumulated points are un-affected.

to the players score, which is flashed on the screen for each 1000 point Bonus
added to it. If the SPECIAL was lit when the ball dropped out, the player receives
double the accumulated Out-Bonus. When the display pauses twice, showing the score,
with either 1 or all zeros trailing it, the Bonus Scoring is at an end. The next
item to be flashed on the display is the balls remaining to play, or the final
score (if the game is over) with no trailing zeros.

The real action comes when a negative number appears on the display. This
can either be -1, -2, or -3. When the player sees a "-1", it means the ball has
reached the left flipper. The player must immediately press the left flipper button
(key "1") to put the ball in play, or it drops out through the Out-Hole. Like wise,
a "-3" means the ball is at the right flipper, requiring the user to key in number
"3" during the 1 second pause.

If a "-2" shows up, it means both flippers will miss, but the player has the
option of "tilting" the machine, by keying in a "2" from the keyboard. The problem
with tilting is that the user only has a 50-50 chance of putting the ball back in
play. If he should succeed, the usual scoring is seen, however, if he fails, the
Out-Bonus accumulated is not added onto the score and the ball is lost. If any balls
remain in the game, they are displayed immediately, or the final score is displayed,
if there were no balls remaining.

START UP:
After initialization (required only once) the display will flash "0". During
a pause, the player presses key "A" labeled "25¢" and a quarter is deducted from
his cash register (no pun intended), R_2. On an HP-67 the display is paused for 5
seconds, showing the number of games remaining. (Each quarter adds 2 more games to
the ones remaining). On an HP-97, the number of games is printed. The display then
goes back to flashing the last score made. It is during one of these pauses that
key "C" can be pressed to view the amount of money spent so far. The display re-
turns to flashing the score.

When key "B" is pressed, a game is deducted from the number remaining, which
is again displayed or printed. Now, all trailing zeros (to the right of the point)
are blanked out, and the number of balls to be played are shown. (The current standard
today is 3 balls per game). This number is continually flashed until the player
shoots the ball, which is accomplished by pressing either the "0" or "." key, which
ever the user feels more comfortable doing. Now the scoring starts. As long as a
"." or a "0" was used during the pause to "shoot" the ball, the program prevents the
ball from dropping right out (a zero coming up). It will not prevent a negative
number from showing up, however, so the player should be on his guard.

Play continues until the ball is lost and the game is over when all 3 balls have
been lost. This is signified by the continual flashing of the final score with the
display set to zero places.

Free games are received for each 50,000 points accumulated at the end of the
game. A free ball is received each time the 5 Drop-Targets are hit, as described
above, on the previous page.

Good luck.

Program Description II

Sketch(es)   How some possible scoring looks:

    900.3   900 points made on the thumper-bumpers (device #3)

    9000.300000   9000 points made on device #3, because SPECIAL was on (extra "0")

    10.7   10 points made on a Drop Target (device #7)

    100.7   100 points made on a Drop Target because all 5 targets are
                       down. An extra ball has been added to the player's remain-
                       ing ones.

Sample Problem(s) Lets have a game and see how it works: Load program, sides 1 and 2.
Initialize with seed: .1541790869   RTN   R/S   0.

Drop in a quarter for 2 games: A   2 ***

                                     (flashed on display)   0.

Ready for game one: B   (# of games)--   1 ***

                3 balls are shown: (flashed on display)   3.

Shoot first ball: .   50.5
                First score made in kick out hole (50.5) then,   10.10000000
        the next gives 10 points and lights SPECIAL. The   100.6000000
        advance roll over is hit next (100.6) adding an add-   -2.000000000
        itional 1000 to the out bonus. Finally a -2 comes up   160.0000000
        but we let the ball drop, giving us 160 plus double   1160.000000
        the out bonus of 2000, or 4000+ 160. This is flashed   2160.000000
        twice more, and the number 2 is now flashed to show   3160.000000
   ball 2 is ready to be shot.   4160.000000

Solution(s) When played out, the second ball will immediately produce a -2, which, if
the player should try for, by tilting (inputting a "2"), he would lose the 1000
bonus that starts each ball shot. On the last ball, the player is forced to use the
right flipper ("3") because the number -3 shows on the display.

NOTES: After each ball has dropped thruogh the out hole, the Drop-Targets are
        reset to 5 and the Out-Bonus is set back to 1000, so the player is always
        assured of at least 1000 points per ball (unless lost through a tilt).
        Also, the SPECIAL scoring is returned to normal after each ball drops.

***-Indicates a 5 second pause or a printed symbol.

Reference(s)   Pamphlets from the following pinball manufacturers:

                Williams Electronics, Inc., 3401 N. Calif. Ave. Chicago, Illinois
                Bally Manufacturing Corporation, 2640 Belmont Ave. Chicago, Ill.
                D. Gottlieb & Co., 165 W. Lake St., Northlake, Ill.

User Instructions

00321D

PINBALL WIZZARD

25¢ CREDIT RCL $
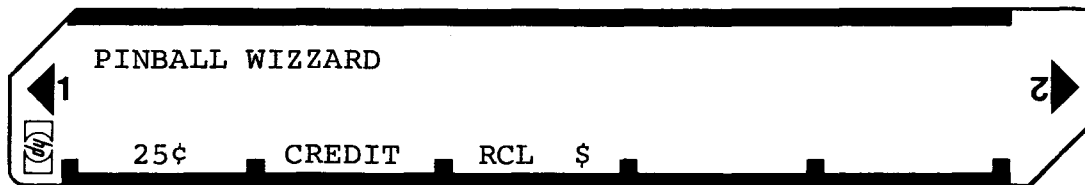
STEP	INSTRUCTIONS	INPUT DATA/UNITS	KEYS		OUTPUT DATA/UNITS
1	Input program (sides 1 and 2)				
2	Input seed number (s) such that 0<(s)<1	(s)	RTN	R/S	0.
	Display will now continually flash "0."				
	until player presses "A" during a pause.				
3	Obtain credit for 2 additional games:		A		last score
	Note: press "A" only when display				
	pauses, . otherwise, program will be				
	halted. At this point previous score of				
	last game (if any) will be paused. This				
	number will be "0." directly after				
	initialization.				
4	Start first game:		B		3.
	Displayed will be the number of balls				
	left to play in game.				
5	Shoot next ball in game:		· or 0		*
	Note: press "." or "0" only when the				
	remaining number of balls is paused on				
	display.				
*	Score is shown to left of point, the scoring				
	device is indicated to the right of the point.				
	If trailing zeros are shown, the SPECIAL is				
	is on and many items score higher (see Prgm.				
	Description I).				
	When "0" is seen, ball has dropped through Out				
	Hole. "-1" indicates left flipper is required,				
	while "-3" indicates right flipper is required.				
	A "-2" means ball is dropping out, but player				
	can attempt a tilt to put ball back in play.				
6	To use left flipper (when "-1" is paused):		1		
7	To use right flipper (when "-3" is paused):		3		
8	Optional--To tilt machine (when "-2" is				
	paused):		2		
9	When current ball is lost through out hole,				
	and Bonus has been collected, next ball is				
	displayed, flashing. To shoot it go to step 5.				
10	When all balls are used up, final score is				
	flashed. If any games remain, go to step 4.				
11	If no games remain, go to step 3.				

∩∩3210

STEP	KEY ENTRY	KEY CODE	COMMENTS
001	FRC	16 44	
002	Pi	16 24	
003	X≷Y	-41	
004	X=0?	16-43	store seed
005	÷	-55	
006	FRC	16 44	
007	STOE	35 15	- - - - - - - -
008	5	05	
009	0	00	
010	STOB	35 12	store constants
011	1	01	
012	0	00	
013	STOA	35 11	
014	X²	53	
015	STOC	35 13	- - - - - - - -
016	CLX	-51	clear registers R0 to R2
017	STO0	35 00	
018	STO1	35 01	
019	STO2	35 02	- - - - - - - -
020	GTOa	22 16 11	
021	*LBLe	21 16 15	subroutine used to generate random numbers.
022	RCLE	36 15	
023	9	09	
024	9	09	
025	7	07	
026	×	-35	
027	FRC	16 44	
028	STOE	35 15	
029	RTN	24	- - - - - - - -
030	*LBLA	21 11	LBL A: Add 2 games to total.
031	2	02	
032	ST+1	35-55 01	
033	.	-62	
034	2	02	
035	5	05	
036	ST-2	35-45 02	
037	RCL1	36 01	
038	PRTX	-14	-print total games
039	*LBLa	21 16 11	- - - - - - - -
040	2	02	LBL f a: test for possible free games.
041	CHS	-22	
042	STOI	35 46	
043	RCL0	36 00	
044	5	05	
045	EEX	-23	
046	4	04	
047	÷	-24	
048	INT	16 34	
049	ST+1	35-55 01	- - - - - - - -
050	RCL0	36 00	loop to show old score.
051	PSE	16 51	
052	GTOi	22 45	- - - - - - - -
053	*LBLC	21 13	LBL C: Recall the total amount of money spent in play
054	DSP2	-63 02	
055	RCL2	36 02	
056	PSE	16 51	

STEP	KEY ENTRY	KEY CODE	COMMENTS
057	R↓	-31	
058	DSF0	-63 00	of the games.
059	RTN	24	- - - - - - -
060	*LBLB	21 12	LBL B: Play -Any games left?
061	RCL1	36 01	
062	X=0?	16-43	
063	GTOa	22 16 11	-No, go to f a
064	1	01	-Else deduct 1 game
065	ST-1	35-45 01	
066	-	-45	
067	PRTX	-14	-Print remaining games
068	0	00	
069	STO0	35 00	-clear old score
070	3	03	
071	STO3	35 03	-reset # of balls
072	*LBLb	21 16 12	- - - - - - -
073	CF0	16 22 00	LBL f b: Clr. SPECIAL flag
074	DSF0	-63 00	
075	5	05	
076	STO7	35 07	-store drop targets
077	EEX	-23	
078	3	03	
079	STO6	35 06	-initialize out hole bonus.
080	*LBLc	21 16 13	- - - - - - -
081	CF3	16 22 03	
082	RCL3	36 03	display remaining balls and loop until user responds.
083	X=0?	16-43	
084	GTOa	22 16 11	
085	PSE	16 51	
086	F3?	16 23 03	
087	F3?	16 23 03	
088	GTOc	22 16 13	- - - - - - -
089	1	01	deduct 1 ball
090	ST-3	35-45 03	- - - - - - -
091	DSP1	-63 01	
092	X≷Y	-41	
093	*LBLa	21 16 14	-obtain first rnd #
094	GSBe	23 16 15	- - - - - - -
095	1	01	
096	2	02	get number from -3 to 8.
097	×	-35	
098	INT	16 34	
099	3	03	
100	-	-45	- - - - - - -
101	X=Y?	16-33	if 1st #=∅, loop back to LBL f d
102	GTOd	22 16 14	
103	X>0?	16-44	- - - - - - -
104	GTOE	22 15	if # positive, gtoE
105	PSE	16 51	- - - - - - -
106	X=0?	16-43	else pause to display #. If ∅ gto∅
107	GTO0	22 00	
108	F3?	16 23 03	- - - - - - -
109	F3?	16 23 03	if no user responce go to ∅
110	GTO0	22 00	
111	CHS	-22	
112	X≠Y?	16-32	

REGISTERS

0 SCORE	1 GAMES	2 $$$	3 BALLS	4	5	6 OUT BONUS	7 DROP TARGETS	8	9
S0	S1	S2	S3	S4	S5	S6	S7	S8	S9

A	B	C	D	E	I
10	50	100		SEED	USED

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STEP	KEY ENTRY	KEY CODE	COMMENTS	STEP	KEY ENTRY	KEY CODE	COMMENTS
113	GTO0	22 00		169	PSE	16 51	
114	2	02	test if tilt option is up. If not, put ball back in play.	170	PSE	16 51	
115	CHS	-22		171	GTOd	22 16 14	
116	X≠Y?	16-32		172	*LBL1	21 01	SPECIAL star roll-overs.
117	GTOd	22 16 14		173	F0?	16 23 00	
118	GSBe	23 16 15		174	GTO1	22 01	
119	2	02	if player has gone for tilt, see if ball is lost or not. Yes-gto f b No-gto f d	175	SF0	16 21 00	
120	x	-35		176	DSP9	-63 05	
121	INT	16 34		177	RCLA	36 11	
122	X=0?	16-43		178	GTOD	22 14	
123	GTOb	22 16 12		179	*LBL1	21 01	
124	GTOd	22 16 14		180	DSP1	-63 01	
125	*LBLE	21 15	Store dsp. in I and jump indirectly.	181	CF0	16 22 00	
126	STOI	35 46		182	*LBL2	21 02	top roll-overs
127	GTOi	22 45		183	RCLA	36 11	
128	*LBL0	21 00	LBL 0: Out hole bonus scoring	184	GTO9	22 09	
129	8	08		185	*LBL3	21 03	thumper (mushroom) bumpers.
130	CHS	-22		186	RCLC	36 13	
131	STOI	35 46		187	RCLA	36 11	
132	RCL0	36 00		188	GTO3	22 03	
133	X≠0?	16-42		189	*LBL4	21 04	
134	GTO0	22 00		190	RCLB	36 12	
135	1	01	if no score yet made give ball back to user.	191	2	02	spinner gate
136	ST+3	35-55 03		192	5	05	
137	DSP0	-63 00		193	*LBL3	21 03	
138	GTOc	22 16 13		194	GSBe	23 16 15	
139	*LBL0	21 00	Else, check if double bonus is to be scored then give out bonus.	195	x	-35	
140	1	01		196	1	01	
141	F0?	16 23 00		197	+	-55	
142	2	02		198	INT	16 34	
143	STx6	35-35 06		199	x	-35	
144	RCL0	36 00		200	GTO9	22 09	
145	PSE	16 51		201	*LBL5	21 05	kick out hole
146	EEX	-23		202	RCLB	36 12	
147	3	03		203	GTO9	22 09	
148	ST-6	35-45 06		204	*LBL6	21 06	
149	ST+0	35-55 00		205	EEX	-23	Bonus Advance star roll-overs.
150	RCL0	36 00		206	3	03	
151	PSE	16 51		207	ST+6	35-55 06	
152	RCL6	36 06		208	RCLA	36 11	
153	X≠0?	16-42		209	GTO9	22 09	
154	GTOi	22 45		210	*LBL7	21 07	
155	R↓	-31		211	RCLA	36 11	
156	PSE	16 51		212	DSZi	16 25 45	
157	GTOb	22 16 12		213	GTOD	22 14	drop targets
158	*LBL9	21 09	score points just made on device checking to see if SPECIAL was on.	214	5	05	
159	F0?	16 23 00		215	STO7	35 07	
160	RCLA	36 11		216	1	01	
161	F0?	16 23 00		217	ST+3	35-55 03	
162	x	-35		218	RCLC	36 13	
163	*LBLD	21 14		219	GTO9	22 09	
164	ST+0	35-55 00		220	*LBL8	21 08	slingshot kickers
165	RCLI	36 46		221	RCLA	36 11	
166	RCLA	36 11		222	GTOD	22 14	
167	÷	-24	set dsp to show both score & device				
168	+	-55					

LABELS					FLAGS	SET STATUS		
A 25¢	B CREDIT	C RCL $	D USED	E USED	0 SPECIAL	FLAGS	TRIG	DISP
a used	b used	c ball disp.	d used	e rnd. # gen.	1	ON OFF		
0 out hole	1 SPECIAL	2 roll overs	3 mushrooms	4 spin. gate	2	0 □ ⊠	DEG ⊠	FIX ⊠
5 kick outs	6 bonus adv.	7 drop targ.	8 sling shot	9 used	3 used	1 □ ⊠	GRAD □	SCI □
						2 □ ⊠	RAD □	ENG □
						3 □ ⊠		n 0

SCORING ITEMS AT A GLANCE

(Two circles at top of board, labeled "SPECIAL")
-Over Stars; switches SPECIAL scoring on and off and
           scores 10 points for each one hit.

(Two slots at top, marked with arrows)
Roll-Overs; scores 10 points or 100 points when
           SPECIAL is lit.

(Two large circles about 1/3 down from top of board)
room or Thumper-Bumpers; scores 100 points each time
           they are hit, or 1000 points when SPECIAL
           is lit. Ball can bounce between them for
           up to 10 times at one instance.

(Slot along left side of machine)
ner Gate; scores 50 points for each spin, or 500 points
           when SPECIAL is lit. Gat can spin as
           much as 25 times when struck.

(Two circles, one by Spinner Gate, the other by
 drop targets, device #7)
Out Holes; scores 50 or 500 when SPECIAL is lit.

(Two circles near bottom marked "Advance Bonus")
is dvance Roll-Overs; scores 10 or 100 if SPECIAL is
           lit. Also adds 1000 more points to Out-
           Hole Bonus.

(Area to the right of board)
-Targets; scores 10 points for the first 4 hit. Scores
           100 or 1000 (if SPECIAL is lit) on fifth
           hit. This fifth shot resets flags and adds
           an additional ball to game.

(Areas above the words "Flippers")
ig Shot Bumpers; scores 10 points when struck.
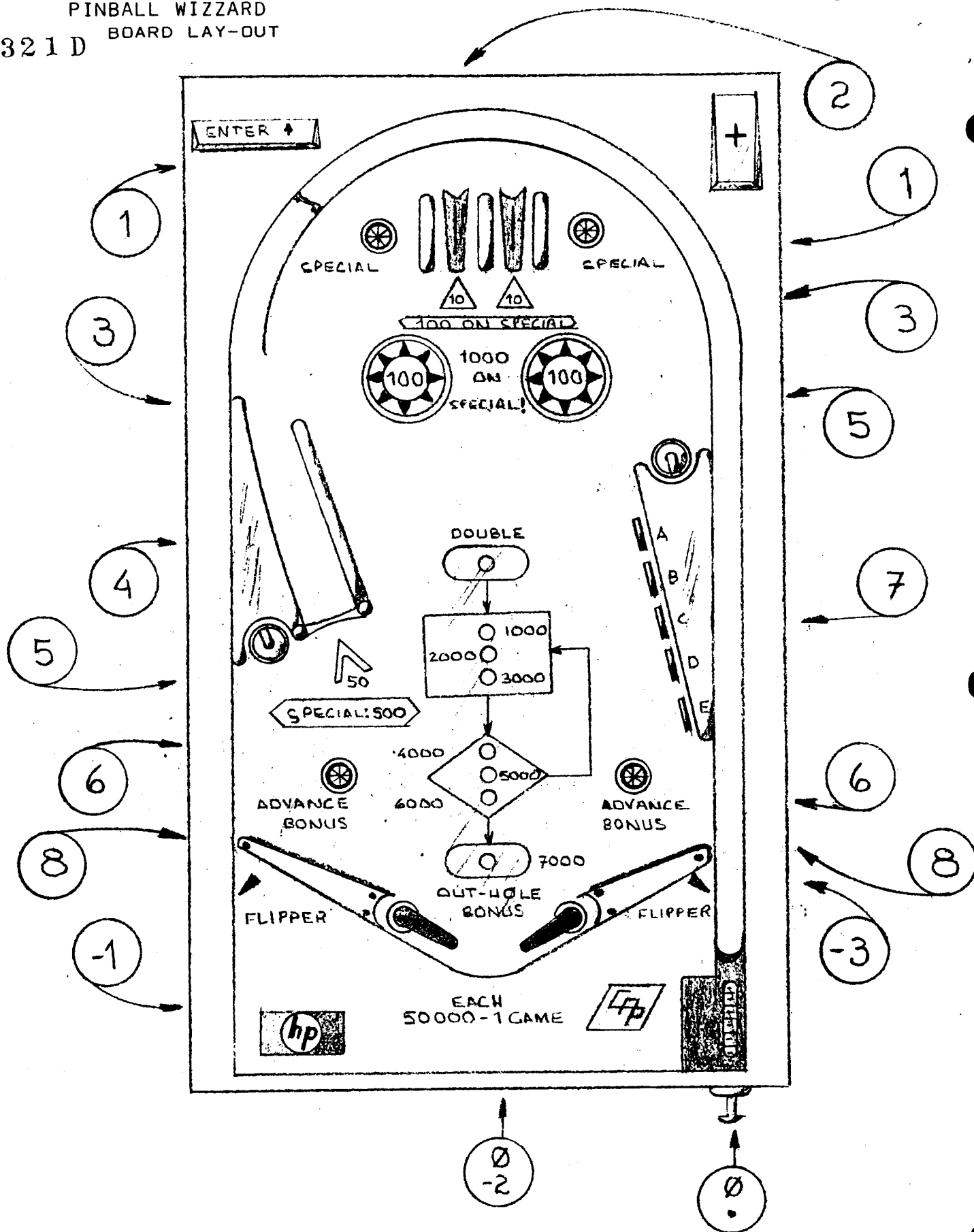
: Left Flipper is called for.

}: Right Flipper is called for.

 Ball falls through Out Hole and collects Bonus points.

 Ball falls through Out Hole and collects Bonus points,
           but gives player the option of tilting to
           put ball in play once more.

L launcher.

PINBALL WIZZARD
BOARD LAY-OUT

00321D

ENTER ↑

+

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③

⑤

⑦

⑥

⑧

-3

SPECIAL   SPECIAL

10   10

100 ON SPECIAL

100   1000
ON   100
SPECIAL!

DOUBLE

A
B
C
D
E

○ 1000
2000 ○
○ 3000

50

SPECIAL: 500

·4000
○ 5000
6000 ○

7000

ADVANCE   ADVANCE
BONUS   BONUS

OUT-HOLE
BONUS

FLIPPER   FLIPPER

①

③

④

⑤

⑥

⑧

-1

EACH
50000-1 GAME

hp

Ø
-2

Ø

SPECIAL NOTE CONCERNING EITHER PROGRAM:

Steps have been added so that on the first ball, should the "ball" drop directly to a flipper or come a -2 (the tilt option) and no score was made, the ball will be returned to the player to shoot again, as it does on many regular pinball machines. Note that if the player chooses to attempt a tilt and fails, the ball will not return. Also, any accumulated score prior to a ball dropping through the out hole will prevent the ball from returning.

*** ADJUSTMENTS FOR LIBERAL SCORING ***

In the previously listed program, the scoring set up is refered to as "conservative"; that is, it is more difficult to score any free balls or free games. To make the game easier, the following changes can be made to adjust your "pinball" machine for easier scoring:

STEP NUMBER:	CHANGE FROM:	TO:	
# 070	3	5	(increase # of balls)
# 075	5	3	(decrease drop targets)
# 119	2	3	(less chance to tilt)
# 182	DELEATE THIS STEP COMPLETELY		
# 183 (was # 184)	GTO 9	GTO D	
GTO STEP # 202 and key in:		LBL 2	(this now becomes step #203)
# 208	RCL A	RCL C	
# 213	GTO D	GTO 9	
# 214	5	3	

By making the following changes listed above, the following now occures:

1. Five (5) balls are provided for each game
2. The number of drop targets needed for a free ball is reduced to 3.
3. First two drop targets down either score 10, or 100 if SPECIAL is lit.
4. Third drop target down either scores 100 or 1000 if SPECIAL is lit.
5. Both devices 2 and 6 (top roll-overs and Bonus advance roll-overs) advance Out Hole Bonus by 1000.
6. Both top roll-overs and Bonus advance roll-overs score 100, or 1000 if SPECIAL is lit.
7. Instead of a 50/50 chance of tilting the machine, the player has a 2 out of 3 chance of putting the ball back in play.

EXCEPT FOR THE CHANGES LISTED ABOVE, ALL OTHER DEVICES WORK THE SAME, AND NO FURTHER PROGRAM CHANGES SHOULD BE MADE.