

HP-41C Calculator 3-Ways Game Pgm by L. Stein
PPC Calculator Journal V9 N4 P58 May-Jul 1982

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01 LBL "3WAYS"      ;(Key 12)
02 FS? 08           ;Skip initial setup if not 1st game
03 GTO 03
04 "SIZE=089?"      ;For prompt
05 AVIEW           ;Prompt for proper SIZE
06 " MOVE"          ;Used in prompts during game
07 ASTO 65
08 "ONE"            ;#1's default ID
09 ASTO 72
10 "TWO"            ;#2's default ID
11 ASTO 73
12 1.1              ;Used to calculate new positions during game
13 STO 81
14 .1
15 STO 82
16 -.9
17 STO 83
18 -1
19 STO 84
20 -1.1
21 STO 85
22 -.1
23 STO 86
24 .9
25 STO 87
26 1
27 STO 88
28 LBL 03
29 CF 28            ;Commas used for coordinate prompts
30 CF 29            ;Deletes unwanted commas in prompts
31 CF 01            ;Not #1's turn
32 CF 02            ;Not #2's turn
33 AOFF            ;Leave ALPHA mode if on
34 "SEED? "        ;For prompt
35 CF 27            ;Out of USER mode for seed entry
36 PROMPT          ;For seed entry
37 FC?C 22         ;Was a # entered?
38 GTO "3WAYS"      ;NO-try again
39 SF 27           ;Set USER mode again
40 RAD             ;Convert seed to 0<=x<=1
41 SIN
42 ABS
43 DEG
44 ASIN
45 90
46 /
47 STO 70          ;Seed location
48 1.064           ;Tile counter
49 STO 00          ;Scratch counter location
50 STO 74          ;Current tile #
51 FIX 0           ;For display
52 0               ;Data for clearing registers
53 LBL 01          ;Clearing loop
54 STO IND 00      ;Clear a register
55 ISG 00          ;All clear?
56 GTO 01          ;NO-next register
57 VIEW 74         ;Current tile #
58 -1              ;#1's goal tile
59 STO 50          ;#1's goal tile location
60 ISG 74          ;Next tile #
61 VIEW 74         ;Current tile #
62 -2              ;#2's goal tile
63 STO 10          ;#2's goal tile location
64 ISG 74          ;Next tile #
65 VIEW 74         ;Current tile #
66 -3              ;#1's home tile
67 STO 15          ;#1's home tile location
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68 ISG 74 ;Next tile #
69 VIEW 74 ;Current tile #
70 -4 ;#2'S home tile
71 STO 55 ;#2'S home tile location
72 ISG 74 ;Next tile #
73 1.006 ;MSD of tile contents
74 STO 66 ;MSD counter location
75 2.007 ;Middle digit of tile contents
76 STO 67 ;Middle digit counter location
77 3.008 ;LSD of tile contents
78 STO 68 ;LSD counter location
79 SF 06 ;Blank tiles being generated
80 5.008 ;Blank tile counter
81 STO 00 ;Scratch counter location
82 LBL 02 ;Tile contents generation loop
83 VIEW 74 ;Current tile #
84 RCL 66 ;Assemble tile contents
85 INT
86 100
87 *
88 RCL 67
89 INT
90 10
91 *
92 +
93 RCL 68
94 INT
95 +
96 STO 71 ;Current tile contents
97 XEQ "R" ;Reset tile #
98 XEQ "RN" ;Select random tile #
99 FC? 06 ;Blank tiles being generated?
100 GTO 00 ;NO-skip blank tile section
101 RCL 00 ;Blank tile counter
102 CHS ;All blank tiles have negative contents
103 RCL IND 69 ;Random tile #
104 X<0? ;Already occupied?
105 GTO 02 ;YES-try again
106 RDN ;NO-go on
107 STO IND 69 ;Place tile in random location
108 ISG 74 ;Next tile #
109 ISG 00 ;Last blank tile?
110 GTO 02 ;NO-go to next blank tile
111 CF 06 ;YES-clear blank tile flag
112 GTO 02 ;Go on to next tile
113 LBL 00 ;Tile placement loop
114 RCL IND 69 ;Random tile #
115 X=0? ;Already occupied?
116 GTO "S" ;NO-save it
117 ISG 69 ;YES-last tile on playing board?
118 GTO 00 ;NO-check last tile
119 XEQ "R" ;Reset tile #
120 GTO 00 ;Try 1st tile on playing board
121 LBL "S" ;Save routine
122 RCL 71 ;Current tile contents
123 STO IND 69 ;Deposit in random position
124 XEQ "NT" ;Next tile
125 GTO 02 ;Handle next tile
126 LBL "MP" ;Main program (key 34)
127 AOFF ;Turn off ALPHA if on
128 FC? 08 ;Has board been set up?
129 GTO "3WAYS" ;NO-set up board
130 BEEP ;Signal that setup is done
131 1.002 ;ID entry counter
132 STO 00 ;Scratch counter location
133 FIX 0 ;For display
134 "NEW ID?" ;For prompt
135 AVIEW
136 PSE
137 "N=0, Y=1." ;Answer No (0) or Yes (1)

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138 1
139 PROMPT
140 X=Y?           ;New IDs desired?
141 GTO 06         ;YES-handle ID entry
142 X=0?           ;New IDs desired?
143 GTO 05         ;NO-go on
144 GTO "MP"       ;Improper entry-try again
145 LBL 06         ;ID entry loop
146 "ID NO. "     ;For prompt
147 ARCL 00
148 AON
149 PROMPT
150 RCL 00         ;ID counter
151 71             ;Calculate ID storage location
152 +
153 ASTO IND X     ;Save ID
154 ISG 00         ;Last ID?
155 GTO 06         ;NO-get other one
156 AOFF          ;ID entry done-turn off ALPHA
157 LBL 05         ;Handle for skip
158 SF 07         ;1st move
159 CF 09         ;Not 2nd move
160 15            ;#1's home tile #
161 STO 67         ;#1's current tile #
162 55            ;#2's home tile #
163 STO 68         ;#2's current tile #
164 2.7           ;#1's home position
165 STO 74         ;#1's current position
166 7.7           ;#2's home position
167 STO 75         ;#2's current position
168 SF 01         ;#1's move
169 CF 02         ;Not #2's move
170 LBL "EM"      ;Enter move (key 11)
171 FC? 08        ;Has board been set up?
172 GTO "3WAYS"   ;NO-set up board
173 CLA           ;For move prompt
174 FS? 07        ;1st move?
175 GTO 07        ;YES-skip legal direction prompt
176 67            ;#1's current tile # location
177 FS? 01        ;#1's move?
178 68            ;#2's current tile # location
179 RCL IND X     ;Opponent's current tile #
180 ARCL IND X    ;Opponent's current tile contents -> ALPHA
181 LBL 07        ;Handle for skip
182 ">" "        ;For prompt
183 73            ;#2's ID location
184 FS? 01        ;#1's move?
185 72            ;YES-#1's ID location
186 ARCL IND X    ;ID -> ALPHA
187 ARCL 65       ;" MOVE"
188 PROMPT       ;For next move
189 FS? 09       ;2nd move?
190 XEQ "SM"     ;YES-special handling needed
191 X=0?         ;Pass?
192 GTO "SW"     ;YES-switch players
193 X<0?         ;Move entry negative?
194 GTO "IM"     ;YES-illegal move
195 INT         ;Move entry non-integer?
196 LASTX
197 X#Y?
198 GTO "IM"     ;YES-illegal move
199 STO 80       ;Scratch location
200 8           ;Move entry > 8
201 X<>Y
202 X>Y?
203 GTO "IM"     ;YES-illegal move
204 FS? 07       ;1st move?
205 XEQ "FM"     ;YES-special handling needed
206 75          ;#2's current position location
207 FS? 01       ;#1's move

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208 74          ;YES-#1's current position location
209 RCL IND X   ;Current position location
210 RCL 80      ;Tentative move direction (TMD)
211 80         ;Calculate new position
212 +
213 X<>Y
214 RCL IND Y
215 +
216 STO 79      ;Tentative new position (TNP)
217 FIX 1       ;For display
218 VIEW 79     ;Display TNP
219 FIX 0       ;For display
220 INT        ;Is TNP off left side of playing board?
221 X=0?
222 GTO "OB"    ;YES-announce it-try again
223 8          ;Is TNP off right side of playing board?
224 X<Y?
225 GTO "OB"    ;YES-announce it-tryh again
226 RCL 79      ;TNP
227 FRC        ;Is TNP off bottom ov playing board?
228 X=0?
229 GTO "OB"    ;YES-announce it-try again
230 .8         ;Is TNP off top of playing board?
231 X<Y?
232 GTO "OB"    ;YES-announce it-try again
233 74         ;Is TNP already occupied?
234 FS? 01
235 75
236 RCL IND X
237 RCL 79
238 X=Y?
239 GTO "OC"    ;YES-announce it-try again
240 FS? 07     ;1st move?
241 GTO 09      ;YES--skip direction test
242 76.078     ;#2's legal direction locations
243 FS? 01     ;#1's move?
244 69.071     ;YES-#1's legal direction locations
245 STO 00     ;scratch counter location
246 LBL 08     ;Test for legal direction
247 RCL 80     ;TMD
248 RCL IND 00 ;Is this direction legal?
249 X=Y?
250 GTO 09     ;YES-go on
251 ISG 00     ;All 3 directions checked?
252 GTO 08     ;NO-try next direction
253 GTO "IM"   ;YES-illegal direction
254 LBL 09     ;Handle for skip
255 7.2       ;Is TNP wrong goal?
256 FS? 01
257 2.2
258 RCL 79
259 X=Y?
260 GTO "WG"   ;YES-announce it-try again
261 2.2       ;Is TNP right goal?
262 FS? 01
263 7.2
264 RCL 79
265 X=Y?
266 GTO "WN"   ;YES-announce win
267 RCL 79     ;Convert position to tile #
268 INT
269 1
270 -
271 8
272 *
273 RCL 79
274 FRC
275 10
276 *
277 +

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278 STO 66           ;Current tile #
279 RCL IND X        ;Is TNP a blank tile?
280 X<0?
281 GTO "BT"         ;YES-announce it-try again
282 75               ;All tests passed-save new position
283 FS? 01
284 74
285 RCL 79
286 STO IND Y
287 68               ;Save new tile #
288 FS? 01
289 67
290 RCL 66
291 STO IND Y
292 68               ;Parse tile contents & save for direction checking
293 FS? 01
294 67
295 RCL IND X
296 RCL IND X
297 100
298 /
299 INT
300 STO 80
301 69
302 FS? 01
303 76
304 RCL 80
305 STO IND Y
306 LASTX
307 FRC
308 10
309 *
310 INT
311 STO 80
312 70
313 FS? 01
314 77
315 RCL 80
316 STO IND Y
317 LASTX
318 FRC
319 10
320 *
321 STO 80
322 71
323 FS? 01
324 78
325 RCL 80
326 STO IND Y
327 CF 09            ;End of move-clear 2nd move flag if set
328 FS? 07           ;1st move?
329 SF 09            ;YES-set 2nd move flag
330 CF 07            ;Clear 1st move flag if set
331 LBL "SW"         ;Switch players
332 FS? 01           ;#1's move?
333 GTO 04           ;YES-handle it
334 SF 01            ;#1's move
335 CF 02            ;Not #2's move
336 GTO "EM"         ;Next move
337 LBL "IM"         ;Illegal move routine
338 "ILLEGAL"        ;For prompt
339 FS? 07           ;1st move?
340 >" 1ST"          ;YES-say so
341 FS? 09           ;2nd move?
342 >" 2ND"          ;YES-say so
343 ARCL 65          ;" MOVE"
344 AVIEW            ;Display prompt
345 PSE
346 AOFF             ;Turn off ALPHA if on
347 GTO "EM"         ;Try again

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348 LBL "SM"           ;2nd move handling
349 X#0?              ;Pass?
350 RTN               ;NO-no special handling needed
351 15                ;Is opponent still on home tile?
352 FS? 01
353 55
354 RCL IND X
355 68
356 FS? 01
357 X<>Y
358 FS? 01
359 67
360 RCL IND X
361 RCL Z
362 X=Y?
363 GTO "IM"          ;YES-illegal move
364 RTN               ;NO-handle normally
365 LBL 04             ;1st player switch
366 CF 01             ;Not #1's move
367 SF 02             ;#2's move
368 GTO "EM"          ;Next move
369 LBL "WN"          ;Announce a win
370 73                ;#2's ID location
371 FS? 01            ;#1's move?
372 72                ;YES-#1's ID location
373 CLA               ;For prompt
374 ARCL IND X        ;ID -> ALPHA
375 >" WINS"          ;For prompt
376 AVIEW
377 TONE 3
378 TONE 6
379 TONE 9
380 TONE 6
381 TONE 9
382 "NEW GAME?"
383 AVIEW
384 PSE
385 "M=SAME BOARD,"
386 AVIEW
387 PSE
388 "B=NEW BOARD."
389 PROMPT
390 GTO "3WAYS"        ;Default to new board
391 LBL "OC"           ;Occupied tile routine
392 "OCCUPIED"         ;For prompt
393 AVIEW              ;Prompt
394 PSE
395 GTO "IM"           ;Illegal move-try again
396 LBL "OB"           ;TNP is off playing board
397 "OFF BOARD"        ;For prompt
398 AVIEW              ;Prompt
399 PSE
400 GTO "IM"           ;Illegal move-try again
401 LBL "BT"           ;Blank tile routine
402 TONE 5             ;Announce blank tile (may be a home tile)
403 "BLANK TILE"
404 AVIEW
405 PSE
406 GTO "IM"           ;Illegal move-try again
407 LBL "WG"           ;Wrong goal routine
408 "WRONG GOAL"       ;For prompt
409 AVIEW              ;Prompt
410 PSE
411 GTO "IM"           ;Illegal move-try again
412 LBL "FM"           ;1st move special handling
413 5                  ;#2's illegal 1st direction
414 FS? 01             ;#1's move?
415 7                  ;YES-#1's illegal 1st move direction
416 RCL 80             ;Is 1st move direct toward goal?
417 X=Y?

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418 GTO "IM"      ;YES-illegal move-try again
419 RTN           ;NO-handle normally
420 LBL "R8"      ;Reset LSD of tile contents
421 RCL 67
422 1.001
423 +
424 STO 68
425 RTN
426 LBL "R7"      ;Reset middle digit of tile contents
427 RCL 66
428 1.001
429 +
430 STO 67
431 XEQ "R8"
432 RTN
433 LBL "R"        ;Reset tile #
434 1.064
435 STO 69
436 RTN
437 LBL "NT"      ;Next tile routine
438 ISG 74         ;Increment current tile #
439 X<> X         ;NOP
440 ISG 68         ;LSD OK?
441 RTN           ;YES-go on
442 ISG 67         ;NO-is middle digit OK?
443 GTO "R8"      ;YES-reset LSD
444 ISG 66         ;NO-increment MSD-all done?
445 GTO "R7"      ;NO-reset both LSDs
446 SF 08         ;Board set up
447 GTO "MP"      ;YES-go to main program
448 LBL "RN"      ;Pseudorandom number generator
449 RCL 70        ;Seed
450 9821          ;Generate new pseudorandom number
451 *
452 .211327
453 +
454 FRC
455 STO 70         ;New seed
456 64            ;Scale pseudorandom number
457 *
458 INT           ;Convert to tile number
459 ST+ 69
460 RTN           ;Go on
461 END

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HP-41C Calculator 3-Ways Game Pgm by L. Stein
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1130 BYTES

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Program Registers Needed: 162

Row 1 (1 - 3)



Row 2 (4 - 6)



Row 3 (6 - 10)



Row 4 (10 - 15)



Row 5 (15 - 20)



Row 6 (20 - 26)



Row 7 (27 - 34)



Row 8 (34 - 38)



Row 9 (38 - 45)



Row 10 (45 - 51)



Row 11 (51 - 58)



Row 12 (59 - 65)



Row 13 (66 - 72)



Row 14 (73 - 76)



Row 15 (76 - 80)



Row 16 (80 - 87)



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Row 17 (88 - 96)



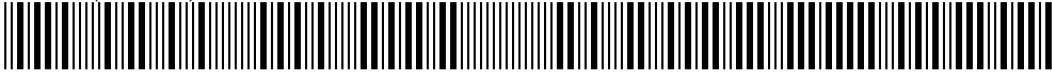
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Row 19 (103 - 110)



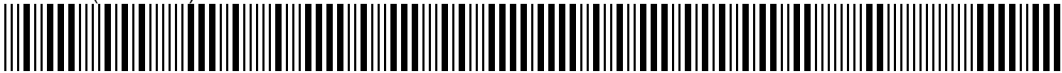
Row 20 (110 - 117)



Row 21 (117 - 121)



Row 22 (122 - 126)



Row 23 (126 - 129)



Row 24 (130 - 134)



Row 25 (134 - 137)



Row 26 (137 - 144)



Row 27 (144 - 147)



Row 28 (148 - 156)



Row 29 (157 - 163)



Row 30 (164 - 169)



Row 31 (169 - 172)



Row 32 (172 - 178)



Row 33 (178 - 184)



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Row 34 (185 - 190)



Row 35 (191 - 197)



Row 36 (198 - 203)



Row 37 (204 - 209)



Row 38 (209 - 217)



Row 39 (217 - 224)



Row 40 (225 - 230)



Row 41 (230 - 236)



Row 42 (236 - 242)



Row 43 (242 - 244)



Row 44 (245 - 252)



Row 45 (253 - 257)



Row 46 (258 - 263)



Row 47 (263 - 269)



Row 48 (270 - 279)



Row 49 (279 - 285)



Row 50 (285 - 291)



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Row 51 (292 - 297)



Row 52 (297 - 304)



Row 53 (305 - 313)



Row 54 (313 - 321)



Row 55 (321 - 327)



Row 56 (328 - 332)



Row 57 (332 - 337)



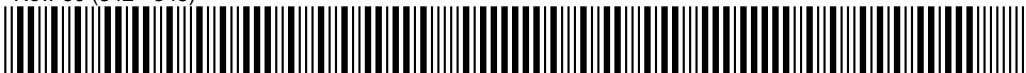
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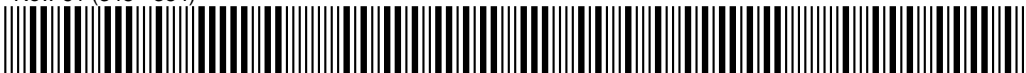
Row 59 (339 - 342)



Row 60 (342 - 348)



Row 61 (348 - 354)



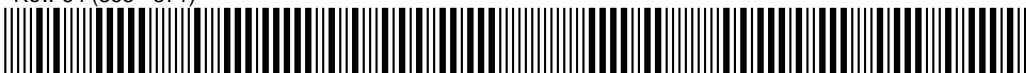
Row 62 (354 - 360)



Row 63 (361 - 367)



Row 64 (368 - 371)



Row 65 (371 - 375)



Row 66 (376 - 382)



Row 67 (382 - 385)



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Row 68 (385 - 387)



Row 69 (388)



Row 70 (389 - 391)



Row 71 (391 - 395)



Row 72 (395 - 397)



Row 73 (397 - 401)



Row 74 (401 - 403)



Row 75 (403 - 407)



Row 76 (407 - 408)



Row 77 (408 - 412)



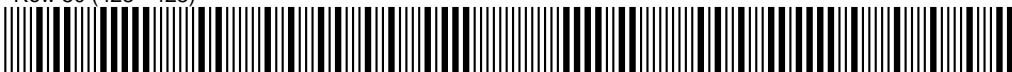
Row 78 (412 - 419)



Row 79 (420 - 422)



Row 80 (423 - 428)



Row 81 (428 - 433)



Row 82 (433 - 437)



Row 83 (437 - 442)



Row 84 (442 - 446)



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Row 85 (447 - 450)



Row 86 (450 - 454)



Row 87 (455 - 461)

