HP-41C Starseed Search Program – Frank Wales

Directions and Program Transcribed w/Barcode by Dr. Jackie F. Woldering

This HP-41C game program is a flight simulator that runs on various incarnations of the 41 programmable calculators, including the HP-41CX, 41CL, and DM41X. Originally published in the October 1981 issue of "Your Computer", it is an easy-to-play game that is enjoyable but often a challenge to succeed in the allotted time.

The original program appears to have been printed on an old HP thermal printer, and was very difficult to read from the Internet Archive page located at URL: https://archive.org/details/your-computer-magazine-1981-10/page/n59/mode/2up While transcribing it, I found and corrected a couple of errors (equal vs. not equal, ST*L vs ST* L, etc.) and made spacing changes to make the output more readable.

In this game, you are the commander of a one-person starship in an uncharted area of space. You must find five starseeds scattered in this 10 x 10 area in the correct order and return to base within 60 stardates to complete your mission successfully.

Each starseed tells you where to look for the next one. The grid also contains 10 randomly placed black holes which will transport you to another random sector. As well, going through a black hole may cause the ship to be irreparably damaged. Starseeds may hide black holes and vice-versa, so be mindful of your approach.

The ship travels in a straight course unless commanded by the keypad to change direction. Ship position is shown on a 10-by-10 grid with base at 0,0 located in the lower left corner using standard Cartesian coordinates x, y, with x increasing to the east and y increasing to the north. You can only move straight, not diagonally.

Think of the ship as positioned on the numeric keypad at 5, so to go east, press 6, to go west, press 4, north is 8 and south is 2. Pressing 0 tells you how much time you have left, and where the next starseed is located with respect to the ship. Press any odd number, and you will be motionless. Pressing any of these buttons will consume a stardate. You can waste time trying, but you cannot move off the grid.

When the ship's position is shown, you have one second or so to enter a digit to make a course correction. If you do not press a key within that timeframe, it will be rejected, the ship will continue in its trajectory, and you will be prompted again. The program does not halt at any point, but uses the PSE function to accept data that you may enter during the time that "SHIP AT x,y" is displayed on the screen.

At the end of a game, the program asks whether you want to play again. Entering the letter "N" will exit the program, entering anything else will start another game.

You may want to enter a random number seed into register 20 before a new game. You may also want to increase the number on line 15 (61) to allow more stardates.

Directions are given as a combination of the following: NORTH, SOUTH, EAST, WEST, or any of four other logical combinations NORTHEAST, NORTHWEST, SOUTHEAST, or SOUTHWEST, or if next starseed is at present location, HERE.

Messages produced by the program are as follows:

INITIALISING: setting up the sector. This takes ~20 seconds on a 41C/CV/CX.

STARSEED 0 IS (direction): shows the direction of the first starseed.

SHIP AT x,y: shows current location of ship and allows entry of new direction.

IN FLIGHT: after pressing 0, indicates the ship is in motion. Followed by:

nn STARDATE(S): shows how much time you have remaining, and

NEXT STARSEED (direction): shows direction of the next starseed.

YOURE OUT OF TIME: your time has expired. Followed by:

STRANDED AT x,y: tells you the location where you got stuck.

WELL DONE: you have succeeded in completing a task. Followed either by:

YOUVE FOUND STARSEED n: signals starseed found and activates flag n, or

YOUVE MADE IT HOME: you have completed mission and returned to base.

NOW RETURN HOME: shown after all starseeds (0 to 4) have been found.

BLACK HOLE: the ship has been caught by a black hole. May be followed by:

SHIP EXPLODED: the ship has broken up on re-entry from hyperspace.

TRY AGAIN?: shown when game ends. Enter "N" to exit, anything else to play.

Program Notes: In the following program, there are a few notation conventions:

X#0? is "X not equal to 0?" or XEQ – ALPHA – X – SHIFT-H – 0 – ? – ALPHA

X#Y? is "X not equal to Y?" or XEQ – ALPHA – X – SHIFT-H – Y – ? – ALPHA

> is Append String so >"HERE" is ALPHA – SHIFT-K – H – E – R – E – ALPHA

CLS is CL∑ entered as XEQ – ALPHA – C – L – SHIFT-F – ALPHA

SREG is ∑REG entered as XEQ – ALPHA – SHIFT-F – R – E – G – ALPHA

Program size: 320 steps, 745 bytes. Checksum: 96h. Set SIZE >= 021 registers.

```
01 LBL "SRCH"
02 LBL 01
03 TONE 7
04 "INITIALISING"
05 AVIEW
06 -7
07 LBL 40
08 CF IND X
09 ISG X
10 GTO 40
11 CF 28
12 CF 29
13 -14
14 STO 18
15 61
16 STO 17
17 .004
18 STO 19
19 LBL 14
20 FIX 1
21 XEQ 20
22 X=0?
23 GTO 14
24 STO IND 18
25 ISG 18
26 GTO 14
27 5
28 STO 15
29 CLX
30 STO 16
31 "STARSEED 0 IS "
32 GTO 09
33 LBL 12
34 FIX 1
35 " SHIP AT "
36 ARCL 16
37 TONE 8
38 FIX 0
39 CF 22
40 AVIEW
41 PSE
42 PSE
43 FC?C 22
44 RCL 15
45 STO 15
46 X=0?
47 " IN FLIGHT"
48 AVIEW
49 INT
50 ABS
51 9
52 X<>Y
53 X>Y?
54 GTO 12
55 2
56 MOD
57 X#0?
58 GTO 05
59 DSE 17
60 GTO IND 15
61 "YOURE OUT OF"
62 >" TIME"
63 TONE 2
64 TONE 0
65 AVIEW
66 "STRANDED AT "
67 FIX 1
68 ARCL 16
69 TONE 1
70 AVIEW
71 PSE
72 GTO 10
73 LBL 00
74 SF 07
75 CLA
76 GTO 03
77 LBL 02
78 RCL 16
79 FRC
80 X=0?
81 GTO 12
82 LASTX
83 .1
84 -
85 GTO 13
86 LBL 04
87 RCL 16
88 INT
89 X=0?
90 GTO 12
91 LASTX
92 1
93 -
94 GTO 13
95 LBL 05
96 RCL 16
97 GTO 13
98 LBL 06
99 RCL 16
100 INT
101 9
102 X=Y?
103 GTO 12
104 LASTX
105 1
106 +
107 GTO 13
108 LBL 08
109 RCL 16
110 FRC
111 .9
112 X=Y?
113 GTO 12
114 LASTX
115 .1
116 +
117 LBL 13
118 STO 16
119 FC? 04
120 GTO 00
121 X=0?
122 GTO 01
123 LBL 00
124 FS? 04
125 GTO 02
126 RCL IND 19
127 X=Y?
128 GTO 01
129 X<>Y
130 LBL 02
131 5.014
132 STO 18
133 LBL 41
134 X<>Y
135 RCL IND 18
136 X=Y?
137 GTO 11
138 ISG 18
139 GTO 41
140 X<>Y
141 GTO 12
142 LBL 01
143 SF IND 19
144 " WELL DONE"
145 AVIEW
146 BEEP
147 "YOUVE "
148 FS? 05
149 GTO 01
150 >"FOUND STAR"
151 >"SEED "
152 RCL 19
153 INT
154 FIX 0
155 ARCL X
156 GTO 00
157 LBL 01
158 "MADE IT HOME"
159 LBL 00
160 TONE 7
161 AVIEW
162 "WITH "
163 LBL 03
164 FIX 0
165 RCL 17
166 1
167 -
168 ARCL X
169 >" STARDATE"
170 1
171 X#Y?
172 >"S"
173 TONE 4
174 AVIEW
175 FS?C 07
176 GTO 01
177 FS? 05
178 GTO 10
179 ISG 19
180 GTO 00
181 LBL 01
182 FC? 04
183 GTO 00
184 "NOW RETURN HOME"
185 TONE 1
186 AVIEW
187 GTO 12
188 LBL 00
189 "NEXT STARSEED "
190 LBL 09
191 RCL 16
192 XEQ 02
193 X<>Y
194 RCL IND 19
195 XEQ 02
196 RDN
197 X>Y?
198 GTO 03
199 X=Y?
200 SF 06
```

For DM41X, V41 emulator, etc., download .RAW file at www.hpcc.org

```
201 X=Y?
202 GTO 00
203 >"SOUTH"
204 GTO 00
205 LBL 03
206 >"NORTH"
207 LBL 00
208 RDN
209 RDN
210 X<Y?
211 GTO 03
212 X=Y?
213 GTO 00
214 >"WEST"
215 GTO 01
216 LBL 03
217 >"EAST"
218 GTO 01
219 LBL 00
220 FS?C 06
221 >"HERE"
222 LBL 01
223 CF 06
224 TONE 8
225 AVIEW
226 PSE
227 GTO 12
228 LBL 02
229 INT
230 LASTX
231 FRC
232 STO L
233 CLX
234 10
235 ST* L
236 CLX
237 LASTX
238 X<>Y
239 RTN
240 LBL 11
241 "BLACK HOLE"
242 TONE 9
243 TONE 8
244 AVIEW
245 XEQ 20
246 2
247 X>Y?
248 GTO 00
249 XEQ 20
250 GTO 13
251 LBL 00
252 "SHIP EXPLODED"
253 TONE 2
254 TONE 0
255 AVIEW
256 PSE
257 GTO 10
258 LBL 20
259 RCL 20
260 9821
261 *
262 .211327
263 +
264 FRC
265 STO 20
266 10
267 *
268 FIX 1
269 RND
270 10
271 X=Y?
272 GTO 20
273 X<>Y
274 RTN
275 LBL 10
276 " TRY AGAIN?"
277 TONE 5
278 AVIEW
279 CF 23
280 AON
281 LBL 44
282 PSE
283 FC?C 23
284 GTO 44
285 AOFF
286 ASTO X
287 "     "
288 ARCL X
289 ASTO X
290 " "
291 ARCL X
292 ASHF
293 ASTO X
294 "N"
295 ASTO Y
296 X#Y?
297 GTO 01
298 "BYE"
299 AVIEW
300 -7
301 LBL 15
302 CF IND X
303 ISG X
304 GTO 15
305 CLST
306 SREG 00
307 CLS
308 SREG 06
309 CLS
310 STO 13
311 SREG 14
312 CLS
313 +
314 CLA
315 FIX 4
316 SF 28
317 SF 29
318 TONE 7
319 CLD
320 END
```

HP-41C Starseed Search by Frank Wales – Program Registers Needed: 107

Row 1 (1 - 4)

Row 2 (4 - 6)

Row 3 (6 - 12)

Row 4 (12 - 17)

Row 5 (17 - 24)

Row 6 (24 - 31)

Row 7 (31 - 32)

Row 8 (32 - 35)

Row 9 (35 - 43)

Row 10 (43 - 47)

Row 11 (47 - 57)

Row 12 (58 - 61)

Row 13 (61 - 62)

Row 14 (63 - 66)

Row 15 (66 - 71)

Row 16 (72 - 80)

Row 17 (81 - 89)

Row 18 (90 - 98)

Row 19 (99 - 108)

Row 20 (109 - 117)

Row 21 (118 - 125)

Row 22 (125 - 131)

Row 23 (132 - 139)

Row 24 (139 - 144)

Row 25 (144 - 147)

Row 26 (147 - 150)

Row 27 (150 - 152)

Row 28 (152 - 158)

Row 29 (158 - 160)

Row 30 (161 - 166)

Row 31 (167 - 169)

Row 32 (169 - 176)

Row 33 (177 - 183)

Row 34 (184)

Row 35 (184 - 189)

Row 36 (189 - 191)

Row 37 (191 - 198)

Row 38 (198 - 203)

Row 39 (203 - 208)

Row 40 (209 - 214)

Row 41 (215 - 220)

Row 42 (220 - 225)

Row 43 (226 - 235)

Row 44 (235 - 241)

Row 45 (241 - 246)

Row 46 (247 - 252)

Row 47 (252 - 254)

Row 48 (254 - 260)

Row 49 (261 - 266)

Row 50 (266 - 274)

Row 51 (275 - 276)

Row 52 (277 - 284)

Row 53 (284 - 289)

Row 54 (289 - 296)

Row 55 (297 - 302)

Row 56 (303 - 310)

Row 57 (311 - 318)

Row 58 (319 - 320)