# 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.

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01 LBL "SRCH" 51 9 101 9 151 >"SEED "

02 LBL 01 52 X<>Y 102 X=Y? 152 RCL 19

03 TONE 7 53 X>Y? 103 GTO 12 153 INT

04 "INITIALISING" 54 GTO 12 104 LASTX 154 FIX 0

05 AVIEW 55 2 105 1 155 ARCL X

06 -7 56 MOD 106 + 156 GTO 00

07 LBL 40 57 X#0? 107 GTO 13 157 LBL 01

08 CF IND X 58 GTO 05 108 LBL 08 158 "MADE IT HOME"

09 ISG X 59 DSE 17 109 RCL 16 159 LBL 00

10 GTO 40 60 GTO IND 15 110 FRC 160 TONE 7

11 CF 28 61 "YOURE OUT OF" 111 .9 161 AVIEW

12 CF 29 62 >" TIME" 112 X=Y? 162 "WITH "

13 -14 63 TONE 2 113 GTO 12 163 LBL 03

14 STO 18 64 TONE 0 114 LASTX 164 FIX 0

15 61 65 AVIEW 115 .1 165 RCL 17

16 STO 17 66 "STRANDED AT " 116 + 166 1

17 .004 67 FIX 1 117 LBL 13 167 -

18 STO 19 68 ARCL 16 118 STO 16 168 ARCL X

19 LBL 14 69 TONE 1 119 FC? 04 169 >" STARDATE"

20 FIX 1 70 AVIEW 120 GTO 00 170 1

21 XEQ 20 71 PSE 121 X=0? 171 X#Y?

22 X=0? 72 GTO 10 122 GTO 01 172 >"S"

23 GTO 14 73 LBL 00 123 LBL 00 173 TONE 4

24 STO IND 18 74 SF 07 124 FS? 04 174 AVIEW

25 ISG 18 75 CLA 125 GTO 02 175 FS?C 07

26 GTO 14 76 GTO 03 126 RCL IND 19 176 GTO 01

27 5 77 LBL 02 127 X=Y? 177 FS? 05

28 STO 15 78 RCL 16 128 GTO 01 178 GTO 10

29 CLX 79 FRC 129 X<>Y 179 ISG 19

30 STO 16 80 X=0? 130 LBL 02 180 GTO 00

31 "STARSEED 0 IS " 81 GTO 12 131 5.014 181 LBL 01

32 GTO 09 82 LASTX 132 STO 18 182 FC? 04

33 LBL 12 83 .1 133 LBL 41 183 GTO 00

34 FIX 1 84 - 134 X<>Y 184 "NOW RETURN HOME"

35 " SHIP AT " 85 GTO 13 135 RCL IND 18 185 TONE 1

36 ARCL 16 86 LBL 04 136 X=Y? 186 AVIEW

37 TONE 8 87 RCL 16 137 GTO 11 187 GTO 12

38 FIX 0 88 INT 138 ISG 18 188 LBL 00

39 CF 22 89 X=0? 139 GTO 41 189 "NEXT STARSEED "

40 AVIEW 90 GTO 12 140 X<>Y 190 LBL 09

41 PSE 91 LASTX 141 GTO 12 191 RCL 16

42 PSE 92 1 142 LBL 01 192 XEQ 02

43 FC?C 22 93 - 143 SF IND 19 193 X<>Y

44 RCL 15 94 GTO 13 144 " WELL DONE" 194 RCL IND 19

45 STO 15 95 LBL 05 145 AVIEW 195 XEQ 02

46 X=0? 96 RCL 16 146 BEEP 196 RDN

47 " IN FLIGHT" 97 GTO 13 147 "YOUVE " 197 X>Y?

48 AVIEW 98 LBL 06 148 FS? 05 198 GTO 03

49 INT 99 RCL 16 149 GTO 01 199 X=Y?

50 ABS 100 INT 150 >"FOUND STAR" 200 SF 06

For DM41X, V41 emulator, etc., download .RAW file at [www.hpcc.org](http://www.hpcc.org)

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201 X=Y? 231 FRC 261 \* 291 ARCL X

202 GTO 00 232 STO L 262 .211327 292 ASHF

203 >"SOUTH" 233 CLX 263 + 293 ASTO X

204 GTO 00 234 10 264 FRC 294 "N"

205 LBL 03 235 ST\* L 265 STO 20 295 ASTO Y

206 >"NORTH" 236 CLX 266 10 296 X#Y?

207 LBL 00 237 LASTX 267 \* 297 GTO 01

208 RDN 238 X<>Y 268 FIX 1 298 "BYE"

209 RDN 239 RTN 269 RND 299 AVIEW

210 X<Y? 240 LBL 11 270 10 300 -7

211 GTO 03 241 "BLACK HOLE" 271 X=Y? 301 LBL 15

212 X=Y? 242 TONE 9 272 GTO 20 302 CF IND X

213 GTO 00 243 TONE 8 273 X<>Y 303 ISG X

214 >"WEST" 244 AVIEW 274 RTN 304 GTO 15

215 GTO 01 245 XEQ 20 275 LBL 10 305 CLST

216 LBL 03 246 2 276 " TRY AGAIN?" 306 SREG 00

217 >"EAST" 247 X>Y? 277 TONE 5 307 CLS

218 GTO 01 248 GTO 00 278 AVIEW 308 SREG 06

219 LBL 00 249 XEQ 20 279 CF 23 309 CLS

220 FS?C 06 250 GTO 13 280 AON 310 STO 13

221 >"HERE" 251 LBL 00 281 LBL 44 311 SREG 14

222 LBL 01 252 "SHIP EXPLODED" 282 PSE 312 CLS

223 CF 06 253 TONE 2 283 FC?C 23 313 +

224 TONE 8 254 TONE 0 284 GTO 44 314 CLA

225 AVIEW 255 AVIEW 285 AOFF 315 FIX 4

226 PSE 256 PSE 286 ASTO X 316 SF 28

227 GTO 12 257 GTO 10 287 " " 317 SF 29

228 LBL 02 258 LBL 20 288 ARCL X 318 TONE 7

229 INT 259 RCL 20 289 ASTO X 319 CLD

230 LASTX 260 9821 290 " " 320 END

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

