

HP-41C Rubik's Cube Solver X by Julian Perry
PPC Calculator Journal Vol 9 N2 P23 Mar 1982

```
01 LBL "X"      ;Memory resident common routines
02 3
03 STO 01
04 STO 02
05 STO 03
06 -9
07 STO 04
08 RTN
09 LBL "Y"
10 6
11 STO 01
12 STO 02
13 CHS
14 STO 03
15 STO 04
16 RTN
17 LBL "Z"
18 9
19 STO 01
20 -3
21 STO 02
22 STO 03
23 STO 04
24 RTN
25 LBL "T"
26 LBL 00
27 INT
28 X=0?
29 RTN
30 LASTX
31 FRC
32 E2
33 *
34 STO 10
35 X<>Y
36 RCL X
37 1
38 ST+ 14
39 -
40 3
41 /
42 X<>Y
43 RCL IND Y
44 +
45 6
46 +
47 XEQ IND X
48 RCL 10
49 DSE 15
50 GTO 00
51 SF 21
52 TONE 6
53 AVIEW
54 12
55 STO 15
56 CLA
57 RCL 10
58 GTO 00
59 LBL 07
60 >"D,"      ;Rotate Down Face Counterclockwise 1/4 Turn
61 3
62 GTO 01
63 LBL 08
64 >"D:"      ;Rotate Down Face Through a Half Turn
65 2
66 GTO 01
67 LBL 09
```

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68 >"D"           ;Rotate Down Face Clockwise 1/4 Turn
69 1
70 LBL 01
71 RCL 16
72 X<> 19
73 X<> 18
74 X<> 17
75 X<> 16
76 X<> 24
77 X<> 27
78 X<> 26
79 X<> 25
80 STO 24
81 X<>Y
82 DSE X
83 GTO 01
84 RTN
85 LBL 10
86 >"F,"         ;Rotate Front Face Counterclockwise 1/4 Turn
87 3
88 GTO 02
89 LBL 11
90 >"F:"         ;Rotate Front Face Through a Half Turn
91 2
92 GTO 02
93 LBL 12
94 >"F"          ;Rotate Down Face Clockwise 1/4 Turn
95 1
96 LBL 02
97 INT
98 RCL 16
99 X<> 17
100 X<> 21
101 X<> 20
102 STO 16
103 RCL 24
104 X<> 29
105 X<> 32
106 X<> 28
107 STO 24
108 1
109 ST- 16
110 ST+ 17
111 ST- 21
112 ST+ 20
113 ST+ 28
114 ST+ 24
115 LASTX
116 DSE X
117 GTO 02
118 RTN
119 LBL 13
120 >"L,"         ;Rotate Left Face Counterclockwise 1/4 Turn
121 3
122 GTO 03
123 LBL 14
124 >"L:"         ;Rotate Left Face Through a Half Turn
125 2
126 GTO 03
127 LBL 15
128 >"L"          ;Rotate Left Face Clockwise 1/4 Turn
129 1
130 LBL 03
131 INT
132 RCL 17
133 X<> 18
134 X<> 22
135 X<> 21
136 STO 17
137 RCL 25

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138 X<> 30
139 X<> 33
140 X<> 29
141 STO 25
142 1
143 ST- 17
144 ST+ 18
145 ST- 22
146 ST+ 21
147 ST+ 29
148 ST+ 25
149 LASTX
150 DSE X
151 GTO 03
152 RTN
153 LBL 16
154 >"B," ;Rotate Bottom Face Counterclockwise 1/4 Turn
155 3
156 GTO 04
157 LBL 17
158 >"B:" ;Rotate Bottom Face Through a Half Turn
159 2
160 GTO 04
161 LBL 18
162 >"B" ;Rotate Bottom Face Clockwise 1/4 Turn
163 1
164 LBL 04
165 INT
166 RCL 18
167 X<> 19
168 X<> 23
169 X<> 22
170 STO 18
171 RCL 26
172 X<> 31
173 X<> 34
174 X<> 30
175 STO 26
176 1
177 ST- 18
178 ST+ 19
179 ST- 23
180 ST+ 22
181 ST+ 30
182 ST+ 26
183 LASTX
184 DSE X
185 GTO 04
186 RTN
187 LBL 19
188 >"R," ;Rotate Right Face Counterclockwise 1/4 Turn
189 3
190 GTO 05
191 LBL 20
192 >"R:" ;Rotate Right Face Through a Half Turn
193 2
194 GTO 05
195 LBL 21
196 >"R" ;Rotate Right Face Clockwise 1/4 Turn
197 1
198 LBL 05
199 INT
200 RCL 19
201 X<> 16
202 X<> 20
203 X<> 23
204 STO 19
205 RCL 27
206 X<> 28
207 X<> 35

```

```

208 X<> 31
209 STO 27
210 1
211 ST- 19
212 ST+ 16
213 ST- 20
214 ST+ 23
215 ST+ 31
216 ST+ 27
217 LASTX
218 DSE X
219 GTO 05
220 RTN
221 LBL 22
222 >"U," ;Rotate Up Face Counterclockwise 1/4 Turn
223 3
224 GTO 06
225 LBL 23
226 >"U:" ;Rotate Up Face Through a Half Turn
227 2
228 GTO 06
229 LBL 24
230 >"U" ;Rotate Up Face Clockwise 1/4 Turn
231 1
232 LBL 06
233 RCL 20
234 X<> 21
235 X<> 22
236 X<> 23
237 X<> 20
238 X<> 32
239 X<> 33
240 X<> 34
241 X<> 35
242 STO 32
243 X<>Y
244 DSE X
245 GTO 06
246 END

```

```

01BBC000F20058133132331C193485C000F200591631325433
3485C000F2005A19311C1332333485C000F200540168678576
691B12423A71907311920E4113437190F2401640AEF32A970F
B100A8159F067E11123F872AB10008F37F442C13B20009F37F
443A12B2000AF27F4411029010CE13CE12CE11CE10CE18CE1B
CE1ACE199118719773B200850BF37F462C13B3000CF37F463A
12B3000DF27F461103689010CE11CE15CE1491109018CE1DCE
20CE1C9118119310921193159214921C9218769773B300850E
F37F4C2C13B4000FF37F4C3A12B400CF0FF27F4C1104689011
CE12CE16CE1591119019CE1ECE21CE1D911911931192129316
9215921D9219769773B40085CF10F37F422C13B500CF11F37F
423A12B500CF12F27F421105689012CE13CE17CE169112901A
CE1FCE22CE1E911A119312921393179216921E921A769773B5
0085CF13F37F522C13B600CF14F37F523A12B600CF15F27F52
1106689013CE10CE14CE179113901BCE1CCE23CE1F911B1193
13921093149217921F921B769773B60085CF16F37F552C13B7
00CF17F37F553A12B700CF18F27F5511079014CE15CE16CE17
CE14CE20CE21CE22CE239120719773B700C0000DBC

```

443 BYTES

HP-41C Rubik's Cube Solver R by Julian Perry
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```
01 LBL "R"      ;Rubik's Cube Solver - Part 1
02 CF 21
03 FS? 55
04 SF 21
05 CF 28
06 CF 29
07 FIX 0
08 CLRG
09 ADV
10 .203221
11 ADV
12 .280229
13 "F"
14 .162417
15 XEQ 50
16 .213322
17 "L"
18 .29033
19 ADV
20 .172518
21 XEQ 50
22 .223423
23 "B"
24 .300431
25 ADV
26 .182619
27 XEQ 50
28 .23352
29 "R"
30 .310528
31 ADV
32 .192716
33 XEQ 50
34 .162417
35 "D"
36 .270125
37 ADV
38 .192618
39 XEQ 50
40 .233422
41 "U"
42 .350633
43 ADV
44 .203221
45 XEQ 50
46 AOFF
47 16.023
48 STO 00
49 GTO 60
50 LBL 50
51 >" FACE"
52 ASTO 00
53 STO 13
54 RDN
55 STO 12
56 RDN
57 STO 11
58 11.013
59 STO 15
60 LBL 51
61 RCL IND 15
62 STO 07
63 CLA
64 ARCL 00
65 >" ROW "
66 RCL 15
67 10
```

```

68 -
69 ARCL X
70 FS? 55
71 XROM 29,01 ;ACA
72 AON
73 TONE 6
74 PROMPT
75 ASTO 09
76 ":" " ;1 colon, 2 spaces
77 ARCL 09
78 ASTO 09
79 CLA
80 ARCL 09
81 FS? 55
82 XROM 29,01 ;ACA
83 FS? 55
84 XROM 29,10 ;PRBUF
85 3
86 STO 08
87 LBL 52
88 "*" ;1 asterisk
89 ARCL 09
90 ASTO 09
91 ASHF
92 RCL 07
93 1 E2
94 *
95 FRC
96 STO 07
97 LASTX
98 RCL IND X
99 SIGN
100 X=0?
101 ARCL L
102 ASTO IND Y
103 DSE 08
104 GTO 52
105 ISG 15
106 GTO 51
107 RTN
108 LBL 68
109 CF 05
110 CF 07
111 CF 08
112 16
113 RCL 00
114 INT
115 X=Y?
116 SF 05
117 20
118 X<Y?
119 SF 05
120 "*****" ;4 asterisks
121 ARCL IND 00
122 ASTO L
123 ASHF
124 ASTO Y
125 "*" ;1 asterisk
126 ARCL L
127 ASTO L
128 ASHF
129 ASTO X
130 "*" ;1 asterisk
131 ARCL L
132 ASHF
133 ASTO 07
134 FS? 05
135 X<>Y
136 STO 08
137 X<>Y

```

```
138 STO 09
139 7.009
140 STO 11
141 LBL 61
142 6
143 STO 12
144 LBL 62
145 RCL IND 12
146 RCL IND 11
147 X=Y?
148 GTO 00
149 DSE 12
150 GTO 62
151 "ERROR"
152 PROMPT
153 LBL 00
154 RCL 12
155 STO IND 11
156 1
157 -
158 5
159 MOD
160 X=0?
161 SF IND 11
162 ISG 11
163 GTO 61
164 RCL 07
165 RCL 08
166 X>Y?
167 X<>Y
168 RCL 09
169 X>Y?
170 X<>Y
171 10
172 /
173 X<> Z
174 X>Y?
175 X<>Y
176 1 E2
177 /
178 X<>Y
179 1 E3
180 /
181 +
182 +
183 STO IND 00
184 302
185 FS? 07
186 300
187 FS? 08
188 301
189 ST+ IND 00
190 ISG 00
191 GTO 60
192 24.035
193 STO 00
194 LBL 70
195 CF 05
196 CF 07
197 CF 08
198 RCL 00
199 INT
200 28
201 X=Y?
202 SF 05
203 "*****" ;5 asterisks
204 ARCL IND 00
205 ASTO L
206 ASHF
207 ASTO Y
```

```
208 "*"           ;1 asterisk
209 ARCL L
210 ASHF
211 ASTO X
212 FS? 05
213 X<>Y
214 STO 07
215 X<>Y
216 STO 08
217 7.008
218 STO 11
219 LBL 71
220 6
221 STO 12
222 LBL 72
223 RCL IND 12
224 RCL IND 11
225 X=Y?
226 GTO 00
227 DSE 12
228 GTO 72
229 "ERROR"
230 PROMPT
231 LBL 00
232 RCL 12
233 STO IND 11
234 1
235 -
236 5
237 MOD
238 X=0?
239 SF IND 11
240 ISG 11
241 GTO 71
242 RCL 07
243 RCL 08
244 X>Y?
245 X<>Y
246 10
247 /
248 X<>Y
249 1 E2
250 /
251 +
252 STO IND 00
253 1
254 FS? 08
255 ST+ IND 00
256 FC? 07
257 FS? 08
258 GTO 00
259 .25
260 RCL IND 00
261 CF 05
262 X=Y?
263 SF 05
264 RCL 08
265 RCL 07
266 FS? 05
267 X<>Y
268 X>Y?
269 SF 07
270 1
271 FC? 07
272 ST+ IND 00
273 LBL 00
274 ISG 00
275 GTO 70
276 ADV
277 ADV
```

```

278 "X"
279 ASTO 11
280 "Y"
281 ASTO 12
282 "Z"
283 ASTO 13
284 0
285 STO 10
286 STO 14
287 CLA
288 SREG 08      ;SigmaREG
289 12.015
290 STO 06
291 INT
292 STO 15
293 LBL 31
294 CLS          ;CLSigma
295 RCL 06
296 2
297 -
298 RCL IND X
299 SIGN
300 X=0?
301 XEQ IND L
302 RCL 06
303 INT
304 1 E2
305 /
306 STO 08
307 24.035
308 STO 07
309 LBL 32
310 RCL IND 07
311 FRC
312 RCL 08
313 X=Y?
314 GTO 00
315 ISG 07
316 GTO 32
317 LBL 00
318 RCL IND 07
319 INT
320 2
321 MOD
322 CF 05
323 X#0?
324 SF 05
325 RCL 07
326 INT
327 23
328 -
329 RCL X
330 4
331 MOD
332 X=0?
333 X<> L
334 5
335 X<>Y
336 -
337 X<>Y
338 RCL IND Y
339 3
340 /
341 -
342 FC? 05
343 -1
344 FS? 05
345 11
346 +
347 X#0?

```

348 XEQ IND X
349 ISG 06
350 GTO 31
351 GTO 40
352 LBL 01
353 8.1605
354 GTO "T"
355 LBL 02
356 11.1705
357 GTO "T"
358 LBL 03
359 14.1805
360 GTO "T"
361 LBL 04
362 3.1301
363 GTO "T"
364 LBL 05
365 4
366 GTO "T"
367 LBL 06
368 1.0703
369 GTO "T"
370 LBL 07
371 14.0614
372 GTO "T"
373 LBL 08
374 5
375 GTO "T"
376 LBL 09
377 16.05
378 GTO "T"
379 LBL 10
380 17.05
381 GTO "T"
382 LBL 11
383 18.05
384 GTO "T"
385 LBL 12
386 6.010903
387 GTO "T"
388 LBL 13
389 7.04
390 GTO "T"
391 LBL 14
392 12.031501
393 GTO "T"
394 LBL 15
395 15.06
396 GTO "T"
397 LBL 16
398 6
399 GTO "T"
400 LBL 17
401 1.0903
402 GTO "T"
403 LBL 18
404 2.1202
405 GTO "T"
406 LBL 19
407 3.1501
408 GTO "T"
409 LBL 20
410 6.031301
411 GTO "T"
412 LBL 21
413 9.0407
414 GTO "T"
415 LBL 22
416 18.130615
417 GTO "T"

```

418 LBL 23
419 13.0615
420 GTO "T"
421 LBL 40
422 2.005
423 STO 06
424 LBL 33
425 CLS           ;CLSigma
426 RCL 06
427 8
428 +
429 RCL IND X
430 SIGN
431 X=0?
432 XEQ IND L
433 .112
434 RCL 06
435 INT
436 1 E3
437 /
438 RCL 06
439 INT
440 1
441 -
442 1 E2
443 /
444 .1
445 +
446 +
447 X=Y?
448 .125
449 STO 08
450 16.023
451 STO 07
452 LBL 34
453 RCL IND 07
454 FRC
455 RCL 08
456 X=Y?
457 GTO 00
458 ISG 07
459 GTO 34
460 LBL 00
461 CF 05
462 CF 06
463 CF 07
464 CF 08
465 RCL 07
466 INT
467 19
468 X<Y?
469 SF 08
470 2
471 RCL IND 07
472 INT
473 3
474 MOD
475 X=0?
476 SF 05
477 1
478 FS? 08
479 X<> Z
480 X=Y?
481 SF 06
482 RDN
483 X=Y?
484 SF 07
485 RCL 07
486 INT
487 15

```

```
488 -
489 RCL X
490 4
491 MOD
492 X=0?
493 X<> L
494 5
495 X<>Y
496 -
497 X<>Y
498 RCL IND Y
499 3
500 /
501 -
502 FS? 05
503 -1
504 FS? 06
505 7
506 FS? 07
507 15
508 +
509 X#0?
510 XEQ IND X
511 ISG 06
512 GTO 33
513 TONE 6
514 RCL 15
515 12
516 STO 15
517 X#Y?
518 AVIEW
519 "LOAD STAGE 2"
520 BEEP
521 PROMPT
522 STOP
523 LBL 01
524 15.0718
525 XEQ "T"
526 9.1613
527 GTO "T"
528 LBL 02
529 15.09170713
530 GTO "T"
531 LBL 03
532 4.12161
533 XEQ "T"
534 18.06
535 GTO "T"
536 LBL 04
537 15.17131615
538 XEQ "T"
539 18.13
540 GTO "T"
541 LBL 05
542 15.17130416
543 XEQ "T"
544 6
545 GTO "T"
546 LBL 06
547 15.18130416
548 XEQ "T"
549 6
550 GTO "T"
551 LBL 07
552 4
553 XEQ "T"
554 17.06151813
555 GTO "T"
556 LBL 08
557 15.16130416
```

558 XEQ "T"
559 6
560 GTO "T"
561 LBL 09
562 15.07161309
563 GTO "T"
564 LBL 10
565 15.10171213
566 GTO "T"
567 LBL 11
568 12.161
569 XEQ "T"
570 18.041606
571 GTO "T"
572 LBL 12
573 4.1606
574 GTO "T"
575 LBL 13
576 15.1613
577 GTO "T"
578 LBL 14
579 15.1713
580 GTO "T"
581 LBL 15
582 18.041606
583 GTO "T"
584 LBL 16
585 4
586 XEQ "T"
587 18.06151813
588 GTO "T"
589 LBL 17
590 7.18
591 XEQ "T"
592 9.16151813
593 GTO "T"
594 LBL 18
595 4.09170706
596 GTO "T"
597 LBL 19
598 4.1218061
599 GTO "T"
600 LBL 20
601 15.1813
602 GTO "T"
603 LBL 21
604 16.151813
605 GTO "T"
606 LBL 22
607 17.151813
608 GTO "T"
609 LBL 23
610 4.1806
611 GTO "T"
612 END

05DBC000F20052A915AC37A815A91CA91D9C008A8F1A121013
1212118F1A121810121219F1461A111612141117E000321A12
1113131212F14C1A12191013138F1A111712151118E000321A
121213141213F1421A1310101413118F1A111812161119E000
321A1213131512F1521A1311101512188F1A111912171116E0
00321A111612141117F1441A1217101112158F1A1119121611
18E000321A121313141212F1551A1315101613138F1A121013
121211E000328B11161A10121330D0003CCF32F67F20464143
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9B099A09879B09AC37A741AC37A74A1338CF34F12A9B099A09
8827111B124269377690F37A679B749AF29708D00034960FD0
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3C12141A10131530CF46A905A907A9082068121878A805F52A
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4BA90563A80527681213419073144B67CE741571417190F213
4341AD051C11AC0511114063AEF39606D0001FD0002802181A
111610151DF1540311111A111710151DF1540411141A111810
151DF15405131A111310111DF15406141DF15407111A101710
131DF1540811141A101611141DF15409151DF1540A11161A10
151DF1540B11171A10151DF1540C11181A10151DF1540D161A
1011101910131DF1540E171A10141DF1540F11121A10131115
10111DF154CF0F11151A10161DF154CF10161DF154CF11111A
101910131DF154CF12121A111210121DF154CF13131A111510
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151DF154CF28121A10101536CF217026184090F37A67AEF41A
1111122668111B134326681141111B12431A114040781A1112
153811161A10121337CF229087692878B1009607D0002201A9
05A906A907A9082768111944A80812908768134B67A80511AC
08CE7178A8067578A80727681115419073144B67CE74157141
7190F2134341AC051C11AC0617AC0711154063AEF39606D000
219F062F11123F797EFC4C4F41442053544147452032868E84
0211151A101711181EF154191A111611131DF1540311151A10
191117101711131DF15404141A11121116111EF15411181A10
161DF1540511151A11171113111611151EF15411181A11131D
F1540611151A11171113101411161EF154161DF1540711151A
11181113101411161EF154161DF15408141EF15411171A1016
1115111811131DF1540911151A11161113101411161EF15416
1DF1540A11151A10171116111310191DF1540B11151A111011
17111211131DF1540C11121A1116111EF15411181A10141116
10161DF1540D141A111610161DF1540E11151A111611131DF1
540F11151A111711131DF154CF0F11181A1014111610161DF1
54CF10141EF15411181A10161115111811131DF154CF11171A
11181EF154191A11161115111811131DF154CF12141A101911
17101710161DF154CF13141A111211181016111DF154CF1411
151A111811131DF154CF1511161A1115111811131DF154CF16
11171A1115111811131DF154CF17141A111810161DF154C000
0DA6

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```
01 LBL "R2"      ;Rubik's Cube Solver - Part 2
02 CLA
03 2.005
04 STO 06
05 LBL 35
06 CLS          ;CLSigma
07 RCL 06
08 8
09 +
10 RCL IND X
11 SIGN
12 X=0?
13 XEQ IND L
14 12
15 RCL 06
16 INT
17 RCL X
18 1
19 -
20 10
21 *
22 +
23 X=Y?
24 25
25 STO 08
26 24.035
27 STO 07
28 LBL 36
29 RCL IND 07
30 FRC
31 E2
32 *
33 RCL 08
34 X=Y?
35 GTO 00
36 ISG 07
37 GTO 36
38 LBL 00
39 CF 01
40 RCL IND 07
41 INT
42 2
43 MOD
44 X#0?
45 SF 01
46 RCL 07
47 INT
48 27
49 -
50 RCL X
51 4
52 MOD
53 X=0?
54 X<> L
55 5
56 X<>Y
57 -
58 X<>Y
59 RCL IND Y
60 3
61 /
62 -
63 FC? 01
64 -1
65 FS? 01
66 7
67 +
```

68 X#0?
69 XEQ IND X
70 ISG 06
71 GTO 35
72 GTO 00
73 LBL 01
74 7.15181316
75 XEQ "T"
76 4.160609
77 GTO "T"
78 LBL 02
79 8.16030518
80 XEQ "T"
81 1
82 GTO "T"
83 LBL 03
84 12.0416
85 XEQ "T"
86 6.181518131
87 GTO "T"
88 LBL 04
89 4.170718
90 XEQ "T"
91 9.1706
92 GTO "T"
93 LBL 05
94 18.0416
95 XEQ "T"
96 6.18151813
97 GTO "T"
98 LBL 06
99 4.16
100 XEQ "T"
101 6.18151813
102 GTO "T"
103 LBL 07
104 10.14161318
105 XEQ "T"
106 14.12
107 GTO "T"
108 LBL 08
109 15.17131815
110 XEQ "T"
111 17.13180416
112 XEQ "T"
113 6
114 GTO "T"
115 LBL 09
116 5.17051705
117 GTO "T"
118 LBL 10
119 9.16090518
120 XEQ "T"
121 6.16050716
122 XEQ "T"
123 7
124 GTO "T"
125 LBL 11
126 14.17141714
127 GTO "T"
128 LBL 12
129 9.05180616
130 XEQ "T"
131 5.07
132 GTO "T"
133 LBL 13
134 15.181316
135 XEQ "T"
136 4.1606
137 GTO "T"

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138 LBL 14
139 16.15181316
140 XEQ "T"
141 4.1606
142 GTO "T"
143 LBL 15
144 15.1712161
145 XEQ "T"
146 17.13
147 GTO "T"
148 LBL 00
149 CLS ;CLSigma
150 CF 01
151 CF 02
152 CF 03
153 CF 04
154 RCL 21
155 FRC
156 .256
157 X=Y?
158 SF 02
159 RCL 22
160 FRC
161 X<>Y
162 X=Y?
163 SF 03
164 RCL 23
165 FRC
166 X<>Y
167 X=Y?
168 SF 04
169 0
170 FS?C 02
171 16
172 FS?C 03
173 17
174 FS?C 04
175 18
176 X#0?
177 XEQ "T"
178 RCL 21
179 FRC
180 .236
181 X=Y?
182 SF 01
183 RCL 22
184 FRC
185 .346
186 X=Y?
187 SF 02
188 RCL 23
189 FRC
190 .456
191 X=Y?
192 SF 03
193 0
194 INT
195 1
196 FC?C 01
197 ST+ L
198 2
199 FC?C 02
200 ST+ L
201 4
202 FC?C 03
203 ST+ L
204 GTO IND L
205 LBL 05
206 18.120918
207 XEQ "T"
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208 7.161
209 XEQ "T"
210 GTO 00
211 LBL 03
212 XEQ "Z"
213 LBL 06
214 7.12091
215 XEQ "T"
216 16.10181218
217 XEQ "T"
218 GTO 00
219 LBL 07
220 RCL 21
221 FRC
222 .346
223 X=Y?
224 GTO 07
225 18.15160718
226 XEQ "T"
227 13.1609
228 XEQ "T"
229 GTO 00
230 LBL 07
231 7.181516
232 XEQ "T"
233 9.181316
234 XEQ "T"
235 LBL 00
236 CLS ;CLSigma
237 RCL 20
238 INT
239 3
240 MOD
241 STO 06
242 X#0?
243 SF 01
244 RCL 21
245 INT
246 3
247 MOD
248 STO 07
249 X#0?
250 SF 02
251 RCL 22
252 INT
253 3
254 MOD
255 STO 08
256 X#0?
257 SF 03
258 RCL 23
259 INT
260 3
261 MOD
262 STO 09
263 X#0?
264 SF 04
265 FS? 01
266 XEQ IND 06
267 FC? 02
268 GTO 00
269 16
270 XEQ "T"
271 XEQ IND 07
272 LBL 00
273 FC? 03
274 GTO 00
275 17
276 FS? 02
277 16
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278 XEQ "T"
279 XEQ IND 08
280 LBL 00
281 FC? 04
282 GTO 00
283 18
284 FS? 02
285 17
286 FS? 03
287 16
288 XEQ "T"
289 XEQ IND 09
290 LBL 00
291 0
292 FS? 02
293 18
294 FS? 03
295 17
296 FS? 04
297 16
298 XEQ "T"
299 GTO 00
300 LBL 01
301 3.060104
302 STO 06
303 XEQ "T"
304 RCL 06
305 GTO "T"
306 LBL 02
307 6.030401
308 STO 06
309 XEQ "T"
310 RCL 06
311 GTO "T"
312 LBL 00
313 SF 01
314 SF 02
315 SF 03
316 SF 04
317 RCL 32
318 INT
319 2
320 MOD
321 X=0?
322 CF 01
323 RCL 33
324 INT
325 2
326 MOD
327 X=0?
328 CF 02
329 RCL 34
330 INT
331 2
332 MOD
333 X=0?
334 CF 03
335 RCL 35
336 INT
337 2
338 MOD
339 X=0?
340 CF 04
341 0
342 INT
343 1
344 FS?C 01
345 ST+ L
346 2
347 FS?C 02

```
348 ST+ L
349 4
350 FS?C 03
351 ST+ L
352 8
353 FS?C 04
354 ST+ L
355 CLS ;CLSigma
356 GTO IND L
357 LBL 06
358 XEQ "X"
359 GTO 01
360 LBL 09
361 XEQ "Z"
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363 LBL 12
364 XEQ "Y"
365 LBL 03
366 LBL 01
367 4.17061512
368 XEQ "T"
369 9.17071013
370 XEQ "T"
371 GTO 00
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374 LBL 05
375 LBL 02
376 7.10131815
377 XEQ "T"
378 12.09061604
379 XEQ "T"
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383 XEQ "T"
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385 XEQ "T"
386 6.1509
387 XEQ "T"
388 LBL 00
389 RCL 32
390 FRC
391 STO 06
392 .26
393 X=Y?
394 SF 01
395 RCL 33
396 FRC
397 STO 07
398 .36
399 X=Y?
400 SF 02
401 RCL 34
402 FRC
403 STO 08
404 .46
405 X=Y?
406 SF 03
407 RCL 35
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409 STO 09
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411 X=Y?
412 SF 04
413 0
414 INT
415 1
416 FC?C 01
417 ST+ L
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420 ST+ L
421 4
422 FC?C 03
423 ST+ L
424 8
425 FC?C 04
426 ST+ L
427 CLS ;CLSigma
428 LASTX
429 X#0?
430 XEQ IND L
431 TONE 6
432 RCL 15
433 12
434 X#Y?
435 AVIEW
436 ADV
437 " "
438 FIX 0
439 CF 29
440 ARCL 14
441 >" MOVES"
442 BEEP
443 AVIEW
444 STOP
445 LBL 07
446 XEQ "Y"
447 .26
448 RCL 07
449 X=Y?
450 GTO 02
451 GTO 01
452 LBL 11
453 XEQ "X"
454 .26
455 RCL 07
456 X=Y?
457 GTO 02
458 GTO 01
459 LBL 13
460 .26
461 RCL 08
462 X=Y?
463 GTO 02
464 GTO 01
465 LBL 14
466 XEQ "Z"
467 .56
468 RCL 07
469 X=Y?
470 GTO 02
471 LBL 01
472 14.18061014
473 XEQ "T"
474 12.041814
475 GTO "T"
476 LBL 02
477 14.16061014
478 XEQ "T"
479 12.041614
480 GTO "T"
481 LBL 15
482 RCL 08
483 .26
484 X=Y?
485 GTO 03
486 RCL 07
487 X=Y?
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489 8.14160511
490 XEQ "T"
491 14.05110818
492 XEQ "T"
493 8.14
494 GTO "T"
495 LBL 03
496 8.14030814
497 XEQ "T"
498 17.081403
499 XEQ "T"
500 8.14
501 GTO "T"
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HP-41C Rubik's Cube Solver X by Julian Perry PPC V9 N2 P23 Mar 1982

Program Registers Needed: 64

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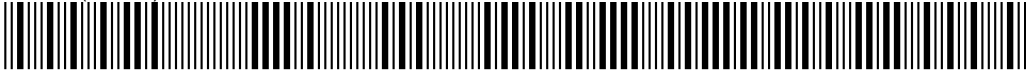
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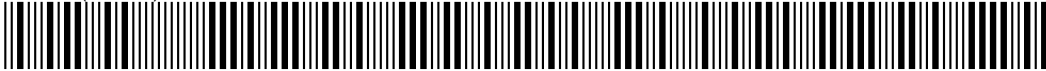
Row 3 (17 - 25)



Row 4 (25 - 33)



Row 5 (34 - 43)



Row 6 (44 - 52)



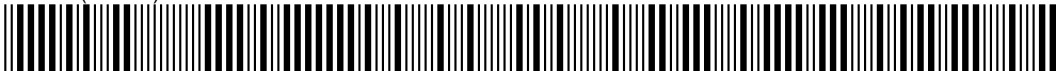
Row 7 (52 - 60)



Row 8 (60 - 67)



Row 9 (68 - 74)



Row 10 (75 - 81)



Row 11 (82 - 88)



Row 12 (89 - 95)



Row 13 (96 - 103)



Row 14 (103 - 110)



Row 15 (110 - 117)



Row 16 (117 - 124)



HP-41C Rubik's Cube Solver X by Julian Perry PPC V9 N2 P23 Mar 1982

Row 17 (124 - 131)



Row 18 (132 - 138)



Row 19 (138 - 145)



Row 20 (145 - 152)



Row 21 (153 - 158)



Row 22 (158 - 165)



Row 23 (166 - 172)



Row 24 (172 - 179)



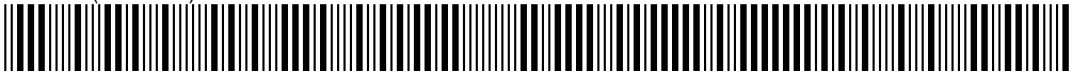
Row 25 (179 - 186)



Row 26 (187 - 192)



Row 27 (192 - 199)



Row 28 (200 - 206)



Row 29 (206 - 213)



Row 30 (213 - 220)



Row 31 (221 - 226)



Row 32 (226 - 233)



Row 33 (233 - 239)



HP-41C Rubik's Cube Solver X by Julian Perry PPC V9 N2 P23 Mar 1982

Row 34 (240 - 246)



Row 35 (246)



HP-41C Rubik's Cube Solver R by Julian Perry PPC V9 N2 P23 Mar 1982

Program Registers Needed: 215

Row 1 (1 - 5)



Row 2 (6 - 10)



Row 3 (11 - 14)



Row 4 (14 - 16)



Row 5 (16 - 20)



Row 6 (20 - 22)



Row 7 (22 - 26)



Row 8 (26 - 28)



Row 9 (28 - 32)



Row 10 (32 - 34)



Row 11 (34 - 38)



Row 12 (38 - 40)



Row 13 (40 - 43)



Row 14 (44 - 47)



Row 15 (47 - 51)



Row 16 (51 - 58)



HP-41C Rubik's Cube Solver R by Julian Perry PPC V9 N2 P23 Mar 1982

Row 17 (58 - 64)



Row 18 (65 - 69)



Row 19 (70 - 76)



Row 20 (76 - 83)



Row 21 (83 - 90)



Row 22 (91 - 100)



Row 23 (101 - 106)



Row 24 (106 - 113)



Row 25 (114 - 120)



Row 26 (120 - 127)



Row 27 (127 - 134)



Row 28 (135 - 142)



Row 29 (143 - 150)



Row 30 (150 - 155)



Row 31 (156 - 164)



Row 32 (165 - 175)



Row 33 (176 - 183)



HP-41C Rubik's Cube Solver R by Julian Perry PPC V9 N2 P23 Mar 1982

Row 34 (184 - 188)



Row 35 (189 - 192)



Row 36 (193 - 200)



Row 37 (201 - 205)



Row 38 (206 - 213)



Row 39 (214 - 221)



Row 40 (222 - 228)



Row 41 (228 - 234)



Row 42 (235 - 243)



Row 43 (244 - 252)



Row 44 (253 - 259)



Row 45 (259 - 267)



Row 46 (268 - 275)



Row 47 (275 - 282)



Row 48 (283 - 289)



Row 49 (289 - 299)



Row 50 (300 - 307)



HP-41C Rubik's Cube Solver R by Julian Perry PPC V9 N2 P23 Mar 1982

Row 51 (307 - 314)



Row 52 (315 - 322)



Row 53 (323 - 332)



Row 54 (333 - 342)



Row 55 (343 - 350)



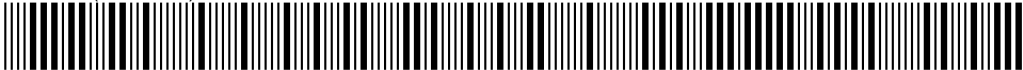
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Row 57 (354 - 357)



Row 58 (358 - 362)



Row 59 (362 - 366)



Row 60 (367 - 371)



Row 61 (371 - 375)



Row 62 (376 - 380)



Row 63 (380 - 384)



Row 64 (384 - 387)



Row 65 (388 - 392)



Row 66 (392 - 395)



Row 67 (395 - 400)



HP-41C Rubik's Cube Solver R by Julian Perry PPC V9 N2 P23 Mar 1982

Row 68 (401 - 404)



Row 69 (404 - 407)



Row 70 (407 - 410)



Row 71 (410 - 413)



Row 72 (414 - 416)



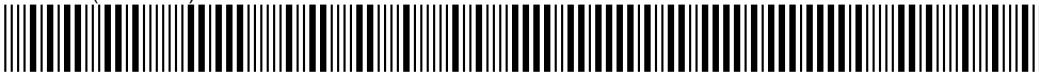
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Row 74 (420 - 424)



Row 75 (425 - 433)



Row 76 (433 - 442)



Row 77 (442 - 450)



Row 78 (450 - 456)



Row 79 (457 - 463)



Row 80 (463 - 471)



Row 81 (472 - 481)



Row 82 (481 - 490)



Row 83 (491 - 501)

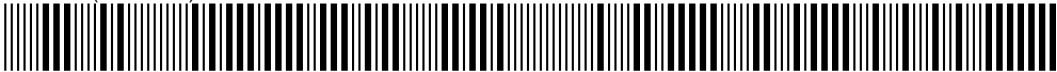


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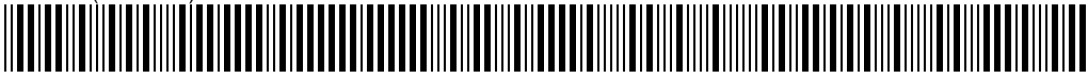


HP-41C Rubik's Cube Solver R by Julian Perry PPC V9 N2 P23 Mar 1982

Row 85 (510 - 516)



Row 86 (517 - 519)



Row 87 (519 - 524)



Row 88 (525 - 528)



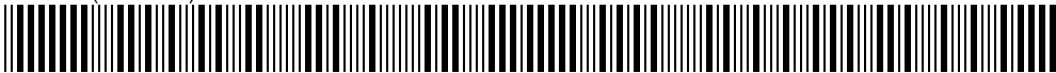
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Row 90 (530 - 534)



Row 91 (534 - 537)



Row 92 (537 - 539)



Row 93 (539 - 542)



Row 94 (542 - 547)



Row 95 (547 - 549)



Row 96 (550 - 554)



Row 97 (554 - 557)



Row 98 (557 - 560)



Row 99 (560 - 562)



Row 100 (562 - 565)

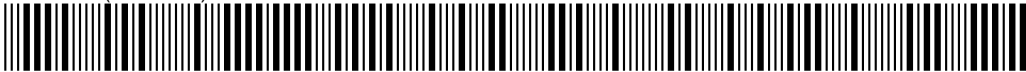


Row 101 (565 - 568)



HP-41C Rubik's Cube Solver R by Julian Perry PPC V9 N2 P23 Mar 1982

Row 102 (569 - 571)



Row 103 (571 - 575)



Row 104 (576 - 579)



Row 105 (579 - 582)



Row 106 (582 - 586)



Row 107 (586 - 587)



Row 108 (588 - 592)



Row 109 (592 - 594)



Row 110 (594 - 596)



Row 111 (596 - 599)



Row 112 (599 - 602)



Row 113 (602 - 605)



Row 114 (605 - 607)



Row 115 (608 - 611)



Row 116 (611 - 612)



HP-41C Rubik's Cube Solver R2 by Julian Perry PPC V9 N2 P23 Mar 1982

Program Registers Needed: 182

Row 1 (1 - 4)



Row 2 (5 - 14)



Row 3 (14 - 24)



Row 4 (24 - 29)



Row 5 (30 - 37)



Row 6 (38 - 47)



Row 7 (48 - 57)



Row 8 (58 - 66)



Row 9 (67 - 74)



Row 10 (74 - 76)



Row 11 (76 - 79)



Row 12 (79 - 82)



Row 13 (82 - 85)



Row 14 (86 - 87)



Row 15 (87 - 90)



Row 16 (91 - 94)



HP-41C Rubik's Cube Solver R2 by Julian Perry PPC V9 N2 P23 Mar 1982

Row 17 (94 - 96)



Row 18 (96 - 100)



Row 19 (100 - 102)



Row 20 (102 - 104)



Row 21 (104 - 108)



Row 22 (109 - 110)



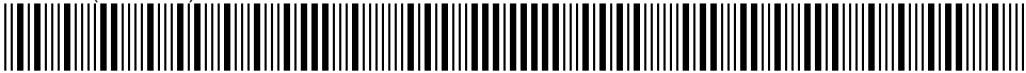
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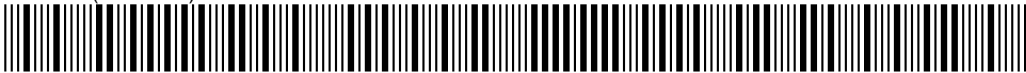
Row 24 (112 - 116)



Row 25 (116 - 119)



Row 26 (119 - 121)



Row 27 (121 - 125)



Row 28 (126 - 127)



Row 29 (127 - 130)



Row 30 (130 - 134)



Row 31 (134 - 136)



Row 32 (136 - 139)



Row 33 (139 - 141)



HP-41C Rubik's Cube Solver R2 by Julian Perry PPC V9 N2 P23 Mar 1982

Row 34 (142 - 144)



Row 35 (144 - 147)



Row 36 (148 - 155)



Row 37 (156 - 163)



Row 38 (163 - 171)



Row 39 (172 - 178)



Row 40 (178 - 185)



Row 41 (185 - 190)



Row 42 (191 - 199)



Row 43 (200 - 206)



Row 44 (206 - 208)



Row 45 (208 - 214)



Row 46 (214 - 216)



Row 47 (216 - 220)



Row 48 (220 - 225)



Row 49 (225 - 227)



Row 50 (227 - 231)



HP-41C Rubik's Cube Solver R2 by Julian Perry PPC V9 N2 P23 Mar 1982

Row 51 (231 - 233)



Row 52 (233 - 240)



Row 53 (241 - 250)



Row 54 (251 - 260)



Row 55 (261 - 268)



Row 56 (269 - 275)



Row 57 (275 - 281)



Row 58 (282 - 288)



Row 59 (288 - 295)



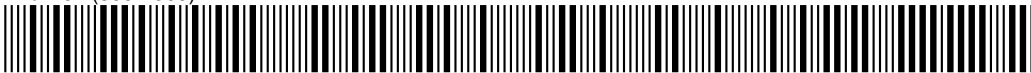
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Row 61 (301 - 305)



Row 62 (305 - 309)



Row 63 (309 - 316)



Row 64 (316 - 325)



Row 65 (326 - 335)



Row 66 (335 - 345)



Row 67 (345 - 353)

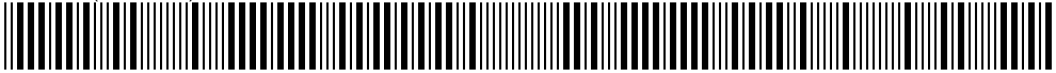


HP-41C Rubik's Cube Solver R2 by Julian Perry PPC V9 N2 P23 Mar 1982

Row 68 (353 - 360)



Row 69 (361 - 367)



Row 70 (367 - 369)



Row 71 (369 - 371)



Row 72 (372 - 376)



Row 73 (376 - 378)



Row 74 (378 - 382)



Row 75 (382 - 384)



Row 76 (384 - 386)



Row 77 (386 - 392)



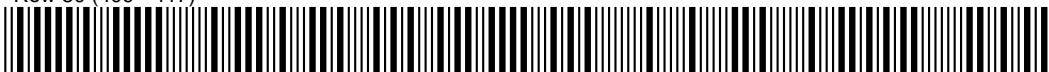
Row 78 (393 - 400)



Row 79 (401 - 408)



Row 80 (409 - 417)



Row 81 (417 - 425)



Row 82 (425 - 433)



Row 83 (434 - 441)



Row 84 (441 - 446)



HP-41C Rubik's Cube Solver R2 by Julian Perry PPC V9 N2 P23 Mar 1982

Row 85 (447 - 453)



Row 86 (454 - 460)



Row 87 (461 - 467)



Row 88 (468 - 472)



Row 89 (472 - 474)



Row 90 (474 - 477)



Row 91 (477 - 479)



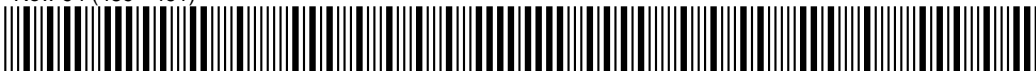
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Row 93 (485 - 489)



Row 94 (489 - 491)



Row 95 (491 - 494)



Row 96 (494 - 496)



Row 97 (497 - 499)



Row 98 (499 - 502)

