

HP-41C Solar/Lunar Eclipses by David G. Bartholomew
PPC Calculator Journal V9 No 4 Page 79 May-Jul 1982
Requires PPC ROM, includes corrections: NOP V10N1P4

```
01 LBL "ECLIPSE" ;Calculate Dates/Times of Eclipses
02 XROM 10,13 ;RF - PPC ROM Reset Flags
03 "YR?" ;Enter the year
04 PROMPT
05 1900
06 -
07 12.3685
08 *
09 INT
10 STO 00
11 LBL 01
12 RCL 00
13 1236.85
14 /
15 STO 01
16 2415020.759
17 STO 02
18 29.53058868
19 RCL 00
20 *
21 ST+ 02
22 RCL 01
23 X^2
24 1.178 E-4
25 *
26 ST+ 02
27 1.55 E-7
28 RCL 01
29 3
30 Y^X
31 *
32 ST- 02
33 9.173 E-3
34 RCL 01
35 3
36 Y^X
37 *
38 132.87
39 RCL 01
40 *
41 X<>Y
42 -
43 166.56
44 +
45 SIN
46 3.3 E-4
47 *
48 ST+ 02
49 21.2964
50 STO 05
51 390.6705064
52 RCL 00
53 *
54 ST+ 05
55 1.6528 E-3
56 RCL 01
57 X^2
58 *
59 ST- 05
60 2.39 E-6
61 RCL 01
62 3
63 Y^X
64 *
65 ST- 05
66 RCL 05
```

```
67 360
68 MOD
69 STO 05
70 CLD
71 SIN
72 ABS
73 .36
74 X>Y?
75 GTO 02
76 CF 21
77 CLA
78 GTO 00
79 LBL 02
80 SF 21
81 BEEP
82 ADV
83 359.2242
84 STO 03
85 29.10535608
86 RCL 00
87 *
88 ST+ 03
89 3.33 E-5
90 RCL 01
91 X^2
92 *
93 ST- 03
94 3.47 E-6
95 RCL 01
96 3
97 Y^X
98 *
99 ST- 03
100 RCL 03
101 360
102 MOD
103 STO 03
104 306.0253
105 STO 04
106 385.816918
107 RCL 00
108 *
109 ST+ 04
110 .0107306
111 RCL 01
112 X^2
113 *
114 ST+ 04
115 1.236 E-5
116 RCL 01
117 3
118 Y^X
119 *
120 ST+ 04
121 RCL 04
122 360
123 MOD
124 STO 04
125 RCL 03
126 +
127 STO 12
128 RCL 03
129 RCL 04
130 -
131 STO 13
132 .1734
133 RCL 01
134 3.93 E-4
135 *
136 -
```

```
137 RCL 03
138 SIN
139 *
140 ST+ 02
141 .0021
142 RCL 03
143 ST+ X
144 SIN
145 *
146 ST+ 02
147 .4068
148 RCL 04
149 SIN
150 *
151 ST- 02
152 .0161
153 RCL 04
154 ST+ X
155 SIN
156 *
157 ST+ 02
158 RCL 12
159 SIN
160 .0051
161 *
162 ST- 02
163 RCL 13
164 SIN
165 .0074
166 *
167 ST- 02
168 RCL 05
169 ST+ X
170 SIN
171 .0104
172 *
173 ST- 02
174 RCL 02
175 FIX 3
176 "JD "
177 ARCL X
178 XROM 10,07 ;VA - PPC ROM View Alpha
179 .5
180 +
181 ENTER
182 FRC
183 24
184 *
185 HMS
186 STO 15
187 X<>Y
188 XROM 20,22 ;JC - PPC ROM Julian Day Number to Calendar Date
189 E2
190 /
191 +
192 X<>Y
193 E6
194 /
195 +
196 FIX 6
197 "DATE "
198 ARCL X
199 XROM 10,07 ;VA - PPC ROM View Alpha
200 FIX 2
201 CLA
202 ARCL 15
203 XROM 10,07 ;VA - PPC ROM View Alpha
204 5.19595
205 STO 06
206 RCL 03
```

207 COS
208 .0048 ;Corrections from PPC NOP
209 * ;Volume 10 Number 1 Page 4
210 ST- 06
211 RCL 03
212 ST+ X
213 COS
214 5 E2
215 /
216 ST+ 06
217 RCL 04
218 COS
219 .3283
220 *
221 ST- 06
222 RCL 12
223 COS
224 .006
225 *
226 ST- 06
227 RCL 13
228 COS
229 .0041
230 *
231 ST+ 06
232 RCL 03
233 SIN
234 .207
235 *
236 STO 07
237 RCL 03
238 ST+ X
239 SIN
240 .0024
241 *
242 ST+ 07
243 RCL 04
244 SIN
245 .039
246 *
247 ST- 07
248 RCL 04
249 ST+ X
250 SIN
251 .0115
252 *
253 ST+ 07
254 RCL 12
255 SIN
256 .0073
257 *
258 ST- 07
259 RCL 13
260 SIN
261 .0067
262 *
263 ST- 07
264 RCL 05
265 ST+ X
266 SIN
267 .0117
268 *
269 ST+ 07
270 RCL 06
271 RCL 05
272 SIN
273 *
274 RCL 07
275 RCL 05
276 COS

```

277 *
278 +
279 STO 08
280 .0059
281 STO 09
282 RCL 03
283 COS
284 .0046
285 *
286 ST+ 09
287 RCL 04
288 COS
289 .0182
290 *
291 ST- 09
292 RCL 04
293 ST+ X
294 COS
295 4 E-4
296 *
297 ST+ 09
298 RCL 12
299 COS
300 2 E3
301 /
302 ST- 09
303 "LAT. "      ;Latitude
304 ARCL 08
305 XROM 10,07 ;PPC ROM View Alpha
306 RCL 00
307 FRC
308 X#0?
309 GTO 10
310 CLA          ;Lines 310-359 were
311 1.5432       ;replaced by lines
312 RCL 09       ;310-358 from NOP
313 +           ;PPC V10 N1 Pg 4.
314 RCL 08       ;Lines 360 to 462
315 ABS          ;are now renumbered
316 X>Y?        ;as lines 359-461.
317 GTO 99
318 .9972
319 STO 07
320 CF 00
321 X<Y?
322 SF 00
323 RCL 09
324 ABS
325 +
326 X<Y?
327 GTO 03
328 FS? 00
329 "NOT CENTRAL"
330 RCL 09
331 X<0?
332 GTO 06
333 FS?C 00
334 GTO 04
335 RCL 08
336 ASIN
337 COS
338 .00464
339 *
340 -
341 LBL 04
342 >"ANNULAR "
343 X>0?
344 GTO 00
345 LBL 06
346 >"TOTAL"

```

```

347 GTO 00
348 LBL 03
349 "PARTIAL"
350 XROM 10,07 ;VA - PPC ROM View Alpha
351 "MAG. " ;Magnitude
352 X<> Z
353 ST- Y
354 RCL 09
355 +
356 RCL 07 ;End of changes for
357 - ;Lines 310-358 from
358 CHS ;NOP: PPC V10 N1 P4
359 / ;Lines 359-461 were
360 STO 10 ;originally numbered
361 ARCL X ;as lines 360-462 on
362 GTO 00 ;V9 Number 4 Page 79
363 LBL 10
364 1.5572
365 RCL 09
366 +
367 RCL 08
368 ABS
369 -
370 .545
371 /
372 STO 10
373 X<0?
374 GTO 99
375 "LUNAR"
376 XROM 10,07 ;VA - PPC ROM View Alpha
377 "P MAG " ;Penumbral Magnitude
378 ARCL X
379 XROM 10,07 ;VA - PPC ROM View Alpha
380 1.0129
381 RCL 09
382 -
383 RCL 08
384 ABS
385 -
386 .545
387 /
388 STO 11
389 CLA
390 X<=0?
391 GTO 00
392 "U MAG " ;Umbral Magnitude
393 ARCL X
394 XROM 10,07 ;VA - PPC ROM View Alpha
395 1.0129
396 RCL 09
397 -
398 X^2
399 RCL 08
400 X^2
401 -
402 SQRT
403 RCL 04
404 COS
405 .04
406 *
407 .5458
408 +
409 1/X
410 STO 14
411 *
412 HMS
413 STO 12
414 .4679
415 RCL 09
416 -

```

```
417 X^2
418 RCL 08
419 X^2
420 -
421 ABS
422 SQRT
423 RCL 14
424 *
425 HMS
426 STO 13
427 RCL 15
428 RCL 12
429 HMS-
430 "P BGN " ;Penumbral Phase Beginning
431 ARCL X
432 XROM 10,07 ;VA - PPC ROM View Alpha
433 RCL 15
434 RCL 13
435 HMS-
436 "U BGN " ;Umbral Phase Beginning
437 ARCL X
438 XROM 10,07 ;VA - PPC ROM View Alpha
439 RCL 15
440 "T MAX " ;Time of Maximum Eclipse
441 ARCL X
442 XROM 10,07 ;VA - PPC ROM View Alpha
443 RCL 13
444 HMS+
445 "U END " ;Umbral Phase Ending
446 ARCL X
447 XROM 10,07 ;VA - PPC ROM View Alpha
448 RCL 15
449 RCL 12
450 HMS+
451 "P END " ;Penumbral Phase Ending
452 ARCL X
453 GTO 00
454 LBL 99
455 "NO ECLIPSE"
456 LBL 00
457 XROM 10,07 ;VA - PPC ROM View Alpha
458 .5
459 ST+ 00
460 GTO 01
461 END
```

03E8C000F80045434C49505345A28DF359523F8E1119101041
11121A131618154268300220111213161A1815433112141115
1012101A1715193212191A1513101518181618204292022151
111A1117181B1C14429202111A15151B1C1721135342930219
1A1117131B1C13211353421113121A1817214271411116161A
15164059131A131B1C1442920212111A12191614351319101A
1617101510161420429205111A161512181B1C132151429305
121A13191B1C16211353429305251316104B357F59611A1316
45B300A91587B10003A815868F1315191A121214123312191A
111015131516101820429203131A13131B1C15215142930313
1A14171B1C16211353429303231316104B331310161A101215
13341318151A181116191118204292041A1011101713101621
51429204111A1213161B1C15211353429204241316104B3423
403C2324413D1A1117131421131A19131B1C14424123594292
021A10101211239273594292021A1410161824594293021A10
111611249273594292022C591A101015114293022D591A1010
1714429302259273591A10111014429302229C03F34A44209B
73A2871A154083691214426C3F71A5161B124340711B164340
9C06F544415445209B73A2879C02879B0FA287151A11191519
1536235A1A101014184293062392735A151B12439206245A1A
131218134293062C5A1A1010164293062D5A1A101014114292
0623591A1210174237239273591A1010121442920724591A10
1319429307249273591A101111154292072C591A1010171342
93072D591A10101617429307259273591A1011111742920726
25594227255A4240381A1010151939235A1A10101416429209
245A1A101118124293092492735A141B1C144292092C5A121B
13439309F54C41542E209B08A287206963BB0087111A151413
122940286145D000631A1919171237A90044A80029614044B4
00AC00FB4E4F542043454E5452414C2966B700AA00B500285C
5A1A1010141614424105F97F414E4E554C41522064B10007F6
7F544F54414CB10004F75041525449414CA287F54D41472E20
CE7193722940274154433A9B73B1000B111A15151712294028
61411A151415433A66D00063F54C554E4152A287F650204D41
47209B73A287111A1011121929412861411A151415433B877B
B100F655204D4147209B73A287111A10111219294151285141
52245A1A1014421A1514151840603E426C3C1A141617192941
5128514161522E426C3D2F2C4AF6502042474E209B73A2872F
2D4AF6552042474E209B73A2872FF654204D4158209B73A287
2D49F65520454E44209B73A2872F2C49F65020454E44209B73
B100CF63FA4E4F2045434C4950534501A2871A159200B200C0
000DDF

1000 BYTES

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Program Registers Needed: 143

Row 1 (1 - 2)



Row 2 (3 - 7)



Row 3 (7 - 13)



Row 4 (13 - 16)



Row 5 (16 - 18)



Row 6 (18 - 24)



Row 7 (24 - 27)



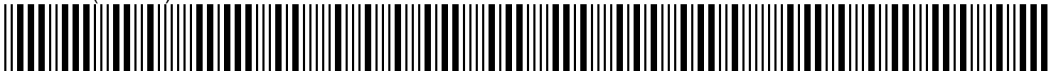
Row 8 (28 - 33)



Row 9 (33 - 40)



Row 10 (41 - 46)



Row 11 (46 - 49)



Row 12 (50 - 52)



Row 13 (53 - 56)



Row 14 (57 - 62)



Row 15 (63 - 72)



Row 16 (73 - 80)



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Row 17 (80 - 85)



Row 18 (85 - 88)



Row 19 (88 - 93)



Row 20 (94 - 99)



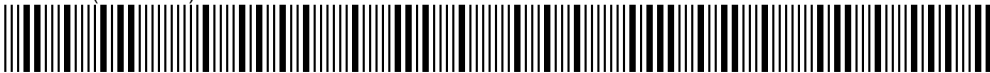
Row 21 (100 - 104)



Row 22 (104 - 107)



Row 23 (108 - 112)



Row 24 (113 - 117)



Row 25 (118 - 127)



Row 26 (128 - 134)



Row 27 (134 - 141)



Row 28 (141 - 147)



Row 29 (147 - 153)



Row 30 (154 - 160)



Row 31 (161 - 167)



Row 32 (168 - 174)



Row 33 (175 - 180)



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Row 34 (181 - 190)



Row 35 (191 - 197)



Row 36 (197 - 204)



Row 37 (204 - 208)



Row 38 (208 - 216)



Row 39 (216 - 223)



Row 40 (224 - 229)



Row 41 (229 - 237)



Row 42 (238 - 244)



Row 43 (245 - 251)



Row 44 (251 - 256)



Row 45 (257 - 263)



Row 46 (264 - 270)



Row 47 (271 - 280)



Row 48 (280 - 287)



Row 49 (288 - 294)



Row 50 (295 - 301)



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Row 51 (302 - 306)



Row 52 (307 - 313)



Row 53 (314 - 320)



Row 54 (320 - 329)



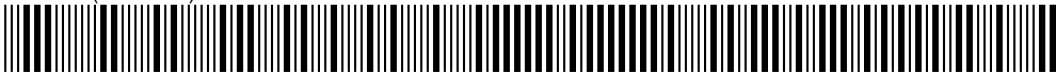
Row 55 (329 - 331)



Row 56 (332 - 338)



Row 57 (338 - 342)



Row 58 (342 - 346)



Row 59 (347 - 350)



Row 60 (351 - 356)



Row 61 (357 - 364)



Row 62 (364 - 372)



Row 63 (373 - 377)



Row 64 (377 - 380)



Row 65 (380 - 387)



Row 66 (388 - 393)



Row 67 (393 - 399)



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Row 68 (400 - 407)



Row 69 (407 - 415)



Row 70 (416 - 428)



Row 71 (429 - 433)



Row 72 (434 - 438)



Row 73 (439 - 443)



Row 74 (444 - 448)



Row 75 (449 - 453)



Row 76 (454 - 455)



Row 77 (456 - 461)

