

GEODETIC TO STATE PLANE COORDINATES

```
1  LBL R (OR WHATEVER AVAILABLE SLOT YOU GOT)
2  XEQ U
3  SF 10
4  GEOD - CCS83
5  ZN1=1:ZN2=2
6  1
7  -
8  STO X
9  X=0?
10 SF 1
11 X>0?
12 SF 2
13 X<0?
14 SF 3
15 CF 10
16 FS? 1
17 INPUT B
18 →HR
19 STO B
20 FS? 1
21 INPUT L
22 →HR
23 STO L
24 FS? 1
25 B-40.8351061249
26 STO A
27 FS? 1
28 Ax(364300.5191+Ax(31.6772+Ax(18.4872+0.0698xA)))
29 STO U
30 FS? 1
31 24244708.924-U
32 STO R
33 FS? 1
34 (122-L)x0.6538843054
35 STO Y
36 FS? 1
37 2187504.093+U+(RxSIN(Y)xTAN(Y÷2))
38 STO N
39 FS? 1
40 6561666.667+(RxSIN(Y))
41 STO E
42 FS? 1
43 RCL Y
44 →HMS
45 STO Y
46 FS? 1
47 VIEW Y
48 FS? 1
```

(arrow pointing to the right)

(symbol for division)

```

49  VIEW N
50  FS? 1
51  VIEW E
52  FS? 1
53  STOP
54  CLVARS
55  FS? 2
56  INPUT B
57  →HR
58  STO B
59  FS? 2
60  INPUT L
61  →HR
62  STO L
63  FS? 2
64  B-39.0846839219
65  STO A
66  FS? 2
67  Ax(364197.5131+Ax(31.3198+Ax(18.4998+0.065577xA)))
68  STO U
69  FS? 2
70  25795162.985-U
71  STO R
72  FS? 2
73  (122-L)x63.0468335285x10^-2
74  STO Y
75  FS? 2
76  2156844.531+U+(RxSIN(Y)xTAN(Y÷2))
77  STO N
78  FS? 2
79  6561666.667+(RxSIN(Y))
80  STO E
81  FS? 2
82  RCL Y
83  →HMS
84  STO Y
85  FS? 2
86  VIEW Y
87  FS? 2
88  VIEW N
89  FS? 2
90  VIEW E
91  FS? 2
92  STOP
93  FS? 3
94  SF 10
95  ZN3=3 : ZN4=4
96  3
97  -
98  STO X
99  x=0?

```

```

100 SF 4
101 x>0?
102 SF 5
103 x<0?
104 SF 6
105 CLVARS
106 CF 10
107 FS? 4
108 INPUT B
109 →HR
110 STO B
111 FS? 4
112 INPUT L
113 →HR
114 STO L
115 FS? 4
116 B-37.7510694363
117 STO A
118 FS? 4
119  $Ax(364119.7127 + Ax(30.9692 + Ax(18.5086 + 0.062493xA)))$ 
120 STO U
121 FS? 4
122 27056804.05-U
123 STO R
124 FS? 4
125  $(120.5-L) \times 61.2232038295 \times 10^{-2}$ 
126 STO Y
127 FS? 4
128  $2095943.327 + U + (Rx \sin(Y) \times \tan(Y \div 2))$ 
129 STO N
130 FS? 4
131  $6561666.667 + (Rx \sin(Y))$ 
132 STO E
133 FS? 4
134 RCL Y
135 →HMS
136 STO Y
137 FS? 4
138 VIEW Y
139 FS? 4
140 VIEW N
141 FS? 4
142 VIEW E
143 FS? 4
144 STOP
145 CLVARS
146 FS? 5
147 INPUT B
148 →HR
149 STO B
150 FS? 5

```

```

151 INPUT L
152 →HR
153 STO L
154 FS? 5
155 B-36.6258593071
156 STO A
157 FS? 5
158  $A_x(364054.6183 + A_x(30.6211 + A_x(18.5174 + 0.060308x_A)))$ 
159 STO U
160 FS? 5
161 28181724.783-U
162 STO R
163 FS? 5
164  $(119-L) \times 0.59658714988$ 
165 STO Y
166 FS? 5
167  $2110955.377 + U + (R \times \sin(Y) \times \tan(Y \div 2))$ 
168 STO N
169 FS? 5
170  $6561666.667 + (R \times \sin(Y))$ 
171 STO E
172 FS? 5
173 RCL Y
174 →HMS
175 STO Y
176 FS? 5
177 VIEW Y
178 FS? 5
179 VIEW N
180 FS? 5
181 VIEW E
182 FS? 5
183 STOP
184 SF 10
185 FS? 6
186 CF 1
187 ZN5=5 : ZN6=6
188 5
189 -
190 STO X
191  $x=0?$ 
192 SF 1
193  $x>0?$ 
194 SF 8
195 CLVARS
196 CF 10
197 FS? 1
198 INPUT B
199 →HR
200 STO B
201 FS? 1

```

```

202 INPUT L
203 →HR
204 STO L
205 FS? 1
206 B-34.7510553142
207 STO A
208 FS? 1
209  $Ax(363934.259 + Ax(29.9356 + Ax(18.5303 + 0.057234xA)))$ 
210 STO U
211 FS? 1
212 30193453.753-U
213 STO R
214 FS? 1
215  $(118-L) \times 57.0011896174 \times 10^{-2}$ 
216 STO Y
217 FS? 1
218  $2095707.846 + U + (Rx \sin(Y) \times \tan(Y \div 2))$ 
219 STO N
220 FS? 1
221  $6561666.667 + (Rx \sin(Y))$ 
222 STO E
223 FS? 1
224 RCL Y
225 →HMS
226 STO Y
227 FS? 1
228 VIEW Y
229 FS? 1
230 VIEW N
231 FS? 1
232 VIEW E
233 FS? 1
234 STOP
235 CLVARs
236 FS? 8
237 INPUT B
238 →HR
239 STO B
240 FS? 8
241 INPUT L
242 →HR
243 STO L
244 FS? 8
245 B-33.3339229447
246 STO A
247 FS? 8
248  $Ax(363861.895 + Ax(29.3368 + Ax(18.5396 + 0.053054xA)))$ 
249 STO U
250 FS? 8
251 31845868.317-U
252 STO R

```

```

253  FS? 8
254  (116.25-L)x54.9517575763x10^-2
255  STO Y
256  FS? 8
257  2065126.163+U+(RxSIN(Y)xTAN(Y÷2))
258  STO N
259  FS? 8
260  6561666.667+(RxSIN(Y))
261  STO E
262  FS? 8
263  RCL Y
264  →HMS
265  STO Y
266  FS? 8
267  VIEW Y
268  FS? 8
269  VIEW N
270  FS? 8
271  VIEW E
272  FS? 8
273  STOP
274  RTN

```

STATE PLANE TO GEODETIC COORDINATES

```

1    LBL F (OR WHATEVER AVAILABLE SLOT YOU GOT)
2    XEQ U
3    SF 10
4    CCS83-GEOD
5    ZN1=1:ZN2=2
6    1
7    -
8    STO X
9    X=0?
10   SF 1
11   X>0?
12   SF 2
13   X<0?
14   SF 3
15   FS? 1
16   INPUT N
17   FS? 1
18   INPUT E
19   CF 10
20   FS? 1
21   ATAN((E-6561666.667)÷(26432213.018-N))
22   STO Y
23   FS? 1
24   122-(Y÷0.6538843054)
25   →HMS
26   STO L

```

```

27  FS? 1
28  N-2187504.093-((E-6561666.667)xTAN(Y÷2))
29  STO U
30  FS? 1
31  40.8351061249+Ux(2.744986448E -06+Ux(-6.55192E -16+Ux(-1.04884E -21+-9.6167E -30xU)))
32  →HMS
33  STO B
34  FS? 1
35  RCL Y
36  →HMS
37  STO Y
38  FS? 1
39  VIEW Y
40  FS? 1
41  VIEW B
42  FS? 1
43  VIEW L
44  FS? 1
45  STOP
46  FS? 2
47  INPUT N
48  FS? 2
49  INPUT E
50  FS? 2
51  ATAN((E-6561666.667)÷(27952007.517-N))
52  STO Y
53  FS? 2
54  122-(Y÷63.0468335285E 02)
55  →HMS
56  STO L
57  FS? 2
58  N-2156844.531-((E-6561666.667)xTAN(Y÷2))
59  STO U
60  FS? 2
61  39.0846839219+Ux(2.745762818E -06+Ux(-6.48347E -16+Ux(-1.0508E -21+-8.9858E -30xU)))
62  →HMS
63  STO B
64  FS? 2
65  RCL Y
66  →HMS
67  STO Y
68  FS? 2
69  VIEW Y
70  FS? 2
71  VIEW B
72  FS? 2
73  VIEW L
74  FS? 2
75  STOP
76  SF 10
77  FS? 3

```

```

78  ZN3=3:ZN4=4
79  3
80  -
81  STO X
82  X=0?
83  SF 4
84  X>0?
85  SF 5
86  X<0?
87  SF 6
88  CF 10
89  FS? 4
90  INPUT N
91  FS? 4
92  INPUT E
93  FS? 4
94  ATAN((E-6561666.667)÷(29152747.378-N))
95  STO Y
96  FS? 4
97  122.5-(Y÷61.2232038295E -02)
98  →HMS
99  STO L
100 FS? 4
101 N-2095943.327-((E-6561666.667)xTAN(Y÷2))
102 STO U
103 FS? 4
104 37.7510694363+Ux(2.746349509E -06+Ux(-6.41501E -16+Ux(-1.0523E -21+-8.5291E -30xU)))
105 →HMS
106 STO B
107 FS? 4
108 RCL Y
109 →HMS
110 STO Y
111 FS? 4
112 VIEW Y
113 FS? 4
114 VIEW B
115 FS? 4
116 VIEW L
117 FS? 4
118 STOP
119 FS? 5
120 INPUT N
121 FS? 5
122 INPUT E
123 FS? 5
124 ATAN((E-6561666.667)÷(30292680.161-N))
125 STO Y
126 FS? 5
127 119-(Y÷0.59658714988)
128 →HMS

```

```

129  STO L
130  FS? 5
131  N-2110955.377-((E-6561666.667)xTAN(Y÷2))
132  STO U
133  FS? 5
134  36.6258593071+Ux(2.746840562E -06+Ux(-6.34643E -16+Ux(-1.05351E -21+-8.1324E -30xU)))
135  →HMS
136  STO B
137  FS? 5
138  RCL Y
139  →HMS
140  STO Y
141  FS? 5
142  VIEW Y
143  FS? 5
144  VIEW B
145  FS? 5
146  VIEW L
147  FS 5?
148  STOP
149  SF 10
150  CF 1
151  FS? 6
152  ZN5=5:ZN6=6
153  5
154  -
155  STO X
156  X=0?
157  SF 1
158  X>0?
159  SF 8
160  CF 10
161  FS? 1
162  INPUT N
163  FS? 1
164  INPUT E
165  FS? 1
166  ATAN((E-6561666.667)÷(32289161.599-N))
167  STO Y
168  FS? 1
169  118-(Y÷57.0011896174E -02)
170  →HMS
171  STO L
172  FS? 1
173  N-2095707.846-((E-6561666.67)xTAN(Y÷2))
174  STO U
175  FS? 1
176  34.7510553142+Ux(2.747748987E -06+Ux(-6.21091E -16+Ux(-1.05565E -21+-7.4567E -30xU)))
177  →HMS
178  STO B
179  FS? 1

```

```

180 RCL Y
181 →HMS
182 STO Y
183 FS? 1
184 VIEW Y
185 FS? 1
186 VIEW B
187 FS? 1
188 VIEW L
189 FS? 1
190 STOP
191 FS? 8
192 INPUT N
193 FS? 8
194 INPUT E
195 FS? 8
196 INPUT H
197 FS? 8
198  $\text{ATAN}((E-6561666.667) \div (33910994.48-N))$ 
199 STO Y
200 FS? 8
201  $116.25-(Y \div 54.9517575763E-02)$ 
202 →HMS
203 STO L
204 FS? 8
205  $N-2065126.163-((E-6561666.667) \times \text{TAN}(Y \div 2))$ 
206 STO U
207 FS? 8
208  $(U^3 \times 1.18E-23) + (U^2 \times 1.14504E-15) + 0.99995414249$ 
209 STO K
210 FS? 8
211  $20,897,688.1759 \div (20,897,576.6759+H)$ 
212 STO R
213 FS? 8
214 RxK
215 STO C
216 FS? 8
217  $33.3339229447 + U_x(2.748295465E-06 + U_x(-6.08981E-16 + U_x(-1.05713E-21 + -7.1424E-30 \times U)))$ 
218 →HMS
219 STO B
220 FS? 8
221 RCL Y
222 →HMS
223 STO Y
224 FS? 8
225 VIEW Y
226 FS? 8
227 VIEW K
228 FS? 8
229 VIEW C
230 FS? 8

```

231 VIEW B
232 FS? 8
233 VIEW L
234 STOP
235 RTN

SUB-ROUTINE:

U0001 LBL U
U0002 CF 10
U0003 CF 0
U0004 CF 1
U0005 CF 2
U0006 CF 3
U0007 CF 4
U0008 CF 5
U0009 CF 6
U0010 CF 8
U0011 CLVARS
U0012 CLx
U0013 RTN

NOTE:

* TO WORK ON A DESIRED ZONE, HIT R/S (TO SCROLL DOWN) UNTIL THE ZONE IS DISPLAYED ... THEN ENTER THE CORRESPONDING ZONE NUMBER TO START.

* INPUT (UNIT): DD.MMSS → US SURVEY FEET (OUTPUT)

B=LATITUDE (DD.MMSS)

L=LONGITUDE (DD.MMSS)

Y=CONVERGENCE ANGLE (DD.MMSS)

N=NORTHINGS

E=EASTINGS

* USE SCIENTIFIC NOTATION WHEN KEYING CONSTANTS WITH MORE THAN 10 DECIMAL PLACES, e.g. 0.000012345678912=1.2345678912x10⁻⁵ (SCIENTIFIC NOTATION)
1.2345678912E -05 (ENG'G. NOTATION)

TRIAL WORKSHEET:

ZONE 1

ZONE 2

B=39.304526785 N=1 706 663.80779
L=122.455912345 E=6 345 392.85482
Y=-0.300414752 Y=-0.300414752

ZONE 3

B=36.455917895 N=1 737 536.71443
L=120.453008942 E=6 485 981.92863
Y=-0.092943054 Y=-0.092943054

ZONE 5

B=34.08131201 N=1 872 390.80305
L=118.19329502 E=6 463 072.09951
Y=-0.110859557 Y=-0.110859557

B=37.554067895 N=1 736 949.91622
L=122.553934567 E=6 294 079.41360
Y=-0.350535170 Y=-0.350535170

ZONE 4

B=35.404897865 N=1 767 630.00534
L=119.455912365 E=6 334 023.00594
Y=-0.272605771 Y=-0.272605771

ZONE 6

B=32.323633328 N=1 778 426.07664
L=117.022417391 E=6 318 184.95045
Y=-0.260292355 Y=-0.260292355

If some characters came out weird, that meant the word version in your PC doesn't recognize the symbols being inserted along the program line(s) as the program is downloaded. If that would be the case, refer to the note @ the end of the program line that defines the corresponding symbol/function for that unrecognized character.