

The following is a computer program which calculates the great circle bearing and distance between a given DX location and DX target(s). This program is written in "HPL", a language used by Hewlett-Packard desktop computers. However, it can be adapted to BASIC (write to Mark if you need help). If nothing else, the last half of the program is mostly a list of latitudes and longitudes, which some may find useful when computing GCB&D on other machines.

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0: "FILE NAME: "GCT":
1: gsb "SCHCLR"
2: wrt 10," GREAT CIRCLE BEARING & DISTANCE PROGRAM"
3: wrt 10," BUILT-IN DATA TABLE VERSION"
4: wrt 10," Refer to ITT book 'Reference Data for Radio Engineers',"
5: wrt 10," pages 28-9, 28-10, & 28-11."
6: wrt 10
7: wrt 10
8: wrt 10,"Simple variables used: ABCDEFGHIJKLMNOPSTUVXYZ"
9: wait 3000
10: gsb "SCHCLR"
11: dim F[56],L[56],S[4],W[4],X[55],Z[55]
12: dim A[55,25],D[3],F[55,1],L[55,1],P[2],O[2],T[7,50]
13: "A":
14: ent "GC distance unit?(MI,NMI,orKM)",D[
15: "Hitting CONTINUE without entry retains previous distance unit.":
16: if D[MI] and D[NMI] and D[KM];gto "A"
17: if D[MI];60;S[4]
18: if D[NMI];69.05;S[4]
19: if D[KM];111.12;S[4]
20: ent "Name of operator's QTH?",A[1]
21: "K":
22: ent "Is operator latitude N or S?",K[1];if K[1]#N and K[1]#S;jmp 0
23: ent "Operator's latitude, degrees?",K[1]
24: if int(K[1])/K[1];gto "KK"
25: 0;S[2];0;S[3]
26: ent "Minutes of operator's latitude?",S[2]
27: ent "Seconds of operator's latitude?",S[3]
28: K[1];S[1];gsb "DECDEG"
29: S[1];K[1]
30: "KK":
31: if K[1]#S;-K[1];K[1]
32: "L":
33: ent "Is op. longitude E or W?",L[1];if L[1]#E and L[1]#W;jmp 0
34: ent "Operator's longitude, degrees?",L[1]
35: if int(L[1])/L[1];gto "LL"
36: 0;S[2];0;S[3]
37: ent "Minutes of operator's longitude?",S[2]
38: ent "Seconds of operator's longitude?",S[3]
39: L[1];S[1];gsb "DECDEG"
40: S[1];L[1]
41: "LL":
42: if L[1]#E;-L[1];L[1]
43: "B":
44: gsb "SCHCLR"
45: wrt 10,"Select data-table output from the following menu:"
46: wrt 10
47: "Metro-Boston")T[1]
48: "East Coast North America")T[2]
49: "Trans-Atlantic")T[3]
50: "Latin America & the Caribbean")T[4]
51: "Western North America, Pacific, & east Asia")T[5]
52: "ALL TABLES")T[6]
53: fmt 8.2x,f1.0,x,c,x,c
54: for Z=1 to 6
55: wrt 10.8,Z,"=",T[Z]
56: next Z
57: ent "Table # (see CRT)",B
58: gsb "SCHCLR"
59: if int(B#B or B.6);gto "B"
60: "0";T[7]
61: if B=6;"B6");T[7]
62: if T[7]#B6;gto "BB"
63: for B=1 to 5
64: "BB":
65: if B=1;gsb "TABLE1"
66: if B=2;gsb "TABLE2"
67: if B=3;gsb "TABLE3"
68: if B=4;gsb "TABLE4"
69: if B=5;gsb "TABLE5"
70: for N=2 to 55
71: if K[N]#S;-K[N];K[N]
72: if L[N]#E;-L[N];L[N]
73: next N
12
    
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74: gsb "CALC"
75: gsb "OUTPUT"
76: if T[7]#B6;gto "BBB"
77: next B
78: "BBB":
79: "Y")Qs
80: ent "More tables(same op.OTH)?(NO=no)",O[
81: if O#NO;gto "B"
82: "Y")Ps
83: ent "New operator OTH?(NO=no)",P[
84: if P#NO;gto "END"
85: gto "A"
86: "END":
87: end
88: "CALC":
89: for J=2 to 55
90: if L[J]=L[1] and K[J]=K[1];0;X[J];0;Z[J];gto "XZOUT"
91: if L[J]=L[1];L[J]+.00001;L[J]
92: if K[J]=K[1];K[J]+.00001;K[J]
93: 1)W[4];% initialise-latitude-mode-to-1(DX-more-easterly-than-op)
94: if L[J]>L[1];2)W[4];% latitude-mode-2(DX-more-westerly-than-op)
95: if K[1]>K[J];gto "OPLATH"
96: "DXLATH":% DX-OTH-latitude=higher
97: K[J];W[1];% greater-latitude:DXOTH(LBofBook)
98: K[1];W[2];% lesser-latitude:opOTH(LAofBook)
99: 1)W[3];% longitude-mode-1(DX-more-northerly-than-op)
100: gto "MATH"
101: "OPLATH":% operator-OTH-latitude=higher
102: K[1];W[1];% greater-latitude:opOTH(LBofBook)
103: K[J];W[2];% lesser-latitude:DXOTH(LAofBook)
104: 2)W[3];% longitude-mode-2(DX-more-southerly-than-op)
105: "MATH":
106: if W[4]=1;L[1]-L[J];C;% latitude-difference
107: if W[4]=2;L[J]-L[1];C;% latitude-difference
108: if C<0;360+C)C
109: if C/180=int(C/180);C+.0001)C
110: W[1]+W[2];U;% LB+LAofBook
111: W[1]-W[2];V;% LB-LAofBook
112: if U/180=int(U/180);U+.0001)U
113: 1/tan(C/2)*(cos(V/2)/sin(U/2));G;% tan((Y-X)/2)
114: atan(G);R;% (Y+X)/2
115: 1/tan(C/2)*(sin(V/2)/cos(U/2));H;% tan((Y-X)/2)
116: atan(H);S;% (Y-X)/2
117: if S/180=int(S/180);S+.0001)S
118: R+S);Y;% angle-between-N-S-pt.-of-greater-long.-fr.-pt.-of-lesser-long.
119: R-S);X;% angle-between-N-S-pt.-of-lesser-long.-fr.-pt.-of-greater-long.
120: tan(V/2)*(sin(R)/sin(S));F;% tan(Z/2)
121: abs(2*atan(F));Z[J];% degrees-of-arc-along-earth's-surface
122: if W[3]=1 and W[4]=1;X[X[J]
123: if W[3]=1 and W[4]=2;360-X[X[J]
124: if W[3]=2 and W[4]=1;Y[Y[J]
125: if W[3]=2 and W[4]=2;360-Y[Y[J]
126: if K[1]+K[J]<0;K[J]-180;X[X[J]
127: if X[J]<0;360+X[J];X[X[J]
128: "XZOUT":
129: if X[J]>359.9;0;X[X[J]
130: "X[J]: great-circle bearing from operator to DX.":
131: next J
132: ret
133: "DECDEG":% degree-decimaliser
134: S[1]+S[2]/60+S[3]/3600)S[1]
135: ret
136: "OUTPUT":
137: if B>1 and T[7]#B6;gto "P"
138: 0)0
139: ent "Print to paper?(1=yes)",O
140: if O=1;6)0;gto "0";% LPselected
141: 10)0;% CRTselected
142: "0":
143: if O=10;gsb "SCHCLR"
144: 1)T
145: if O=6;ent "Number of copies?",T
146: "P":
147: for P=1 to T
148: if O=6;beep;dsp "Hit PAGE button on printer.":wait 5000;dsp ""
149: fmt 7,72;"*
150: wrt 0+.7
151: fmt 1,3c,f7.3,2c,f7.3,2c
152: 56)A;abs(K[1])K[56];abs(L[1])L[56]
153: wrt 0+.1,"Operator OTH : ",A[1]," ( ",K[A],K[1]," / ",L[A],L[1]," )"
154: wrt 0
    
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155: fmt 9,c,x,f1.0,x,c,x,c
156: wrt 0+.9,"Table",B,"",T#(B)
157: wrt 0
158: fmt 2,3x,c,22x,c,8x,c,7x,3c
159: wrt 0+.2," DX QTH ", "coordinates", "GCB", "GCD(",D#,")"
160: fmt 3,72"--
161: wrt 0+.3
162: for M=2 to 55
163: 27-len(A#(M)))D
164: fmt 4,c,z
165: wrt 0+.4,A#(M)
166: for K=1 to D
167: fmt 5,x,z
168: wrt 0+.5
169: next K
170: fmt 6,f7.3,2c,f7.3,c,5x,f5.1,5x,f8.2
171: wrt 0+.6,abs(L(M)),L#(M)," / ",abs(K(M)),K#(M),X(M),S(4)*Z(M)
172: next M
173: next P
174: ret
175: "SCNCLR":% clearCRTscreen
176: for E=1 to 25
177: wrt 10
178: next E
179: ret
180: % DATA-TABLE-CONSTRUCTION-SUBROUTINES
181: "TABLE1":% Metro-Boston
182: for Z=2 to 55
183: "N")K#(Z);"W")L#(Z)
184: next Z
185: "WEE1-590 (Medford)"A#(2);71.088)L(2);42.41)K(2)
186: "WRK0-680 (Burlington)"A#(3);71.217)L(3);42.49)K(3)
187: "WCRS-740 (Cambridge)"A#(4);71.145)L(4);42.383)K(4)
188: "WHDH-850 (Needham)"A#(5);71.265)L(5);42.25)K(5)
189: "WRDL-950 (Saugus)"A#(6);70.988)L(6);42.44)K(6)
190: "WBEZ-1030 (Hull)"A#(7);70.875)L(7);42.278)K(7)
191: "WILD-1090 (Medford)"A#(8);71.083)L(8);42.413)K(8)
192: "WHUE-1150 (Lexington)"A#(9);71.213)L(9);42.41)K(9)
193: "WESX-1230 (Marblehead)"A#(10);70.867)L(10);42.517)K(10)
194: "WEJZ-1260 (E.Milton)"A#(11);71.038)L(11);42.27)K(11)
195: "WJDA-1300 (Quincy)"A#(12);70.983)L(12);42.263)K(12)
196: "WDLW-1330 (Waltham)"A#(13);71.26)L(13);42.358)K(13)
197: "WLYN-1360 (Lynn)"A#(14);70.975)L(14);42.45)K(14)
198: "WFKS-1430 (Medford)"A#(15);71.083)L(15);42.4)K(15)
199: "WMRE-1510 (Waltham)"A#(16);71.2)L(16);42.385)K(16)
200: "WHITN-1550 (Newton)"A#(17);71.25)L(17);42.35)K(17)
201: "WUNP-1600 (Newton)"A#(18);71.19)L(18);42.288)K(18)
202: "TV Towers(Needham/Newton)"A#(19);71.22)L(19);42.305)K(19)
203: "CT - Hartford" A#(20);72.6833)L(20);41.7667)K(20)
204: "CT - Putnam" A#(21);71.9167)L(21);41.9167)K(21)
205: "MA - Acton" A#(22);71.4333)L(22);42.4833)K(22)
206: "MA - Arlington Belmont" A#(23);71.17)L(23);42.411)K(23)
207: "MA - Billerica" A#(24);71.223)L(24);42.538)K(24)
208: "MA - Boston" A#(25);71.063)L(25);42.36)K(25)
209: "MA - Bourne(Sagamore Br.)" A#(26);70.55)L(26);41.775)K(26)
210: "MA - Brockton" A#(27);71.0167)L(27);42.0833)K(27)
211: "MA - Chatham" A#(28);69.95)L(28);41.67)K(28)
212: "MA - Dennisport" A#(29);70.13)L(29);41.66)K(29)
213: "MA - Fall River" A#(30);71.1333)L(30);41.7167)K(30)
214: "MA - Falmouth" A#(31);70.6333)L(31);41.5667)K(31)
215: "MA - Fitchburg" A#(32);71.8)L(32);42.5883)K(32)
216: "MA - Foxborough" A#(33);71.2667)L(33);42.0667)K(33)
217: "MA - Framingham" A#(34);71.4167)L(34);42.2833)K(34)
218: "MA - Great Blue Hill" A#(35);71.1)L(35);42.225)K(35)
219: "MA - Haverhill" A#(36);71.0833)L(36);42.7833)K(36)
220: "MA - Lawrence" A#(37);71.15)L(37);42.7)K(37)
221: "MA - Lowell" A#(38);71.3)L(38);42.65)K(38)
222: "MA - Marshfield" A#(39);70.72)L(39);42.1)K(39)
223: "MA-Martha's Vineyard(SW)" A#(40);70.8617)L(40);41.35)K(40)
224: "MA - Milford" A#(41);71.5333)L(41);42.1333)K(41)
225: "MA - New Bedford" A#(42);70.9333)L(42);41.6333)K(42)
226: "MA - Newburyport" A#(43);70.8833)L(43);42.8167)K(43)
227: "MA - Plymouth" A#(44);70.6667)L(44);41.9667)K(44)
228: "MA - Provincetown" A#(45);70.18)L(45);42.07)K(45)
229: "MA - Rockport" A#(46);70.6)L(46);42.665)K(46)
230: "MA - Springfield" A#(47);72.6)L(47);42.1167)K(47)
231: "MA - Sudbury" A#(48);71.455)L(48);42.395)K(48)
232: "MA - Taunton" A#(49);71.1)L(49);41.9)K(49)
233: "MA - Worcester" A#(50);71.8)L(50);42.2667)K(50)
234: "MA - Keene" A#(51);72.2833)L(51);42.9333)K(51)
235: "MA - Manchester" A#(52);71.4667)L(52);42.9833)K(52)
236: "MA - Portsmouth" A#(53);70.7667)L(53);43.0667)K(53)
237: "RI - Narragansett" A#(54);71.45)L(54);41.43)K(54)
238: "RI - Providence" A#(55);71.4167)L(55);41.8333)K(55)

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239: ret
240: "TABLE2":% EastCoastNorthAmerica
241: for Z=2 to 55
242: "N")K#(Z);"W")L#(Z)
243: next Z
244: "St.Pierre/Miquelon")A#(2);56.1667)L(2);46.9167)K(2)
245: "LABRADOR - Hebron")A#(3);63.5)L(3);59.1667)K(3)
246: "NF - St. Anthony")A#(4);55.5833)L(4);51.3667)K(4)
247: "NF - St. John's")A#(5);52.68)L(5);47.57)K(5)
248: "NS - Halifax")A#(6);63.58)L(6);44.63)K(6)
249: "NS - Sydney")A#(7);60.1833)L(7);46.15)K(7)
250: "NS - Yarmouth")A#(8);66.13)L(8);43.83)K(8)
251: "ON - Toronto")A#(9);79.42)L(9);43.7)K(9)
252: "OU - Gaspe")A#(10);64.4833)L(10);48.8333)K(10)
253: "OU - Montreal")A#(11);73.6)L(11);45.5)K(11)
254: "OU - Quebec City")A#(12);71.2167)L(12);46.8167)K(12)
255: "CT - New London")A#(13);72.1)L(13);41.35)K(13)
256: "DC - Washington")A#(14);77)L(14);38.92)K(14)
257: "FL - Daytona Beach")A#(15);81)L(15);29.2)K(15)
258: "FL - Miami")A#(16);80.2)L(16);25.75)K(16)
259: "FL - Pensacola")A#(17);87.25)L(17);30.4)K(17)
260: "GA - Atlanta")A#(18);84.38)L(18);33.75)K(18)
261: "GA - Brunswick")A#(19);81.4833)L(19);31.1667)K(19)
262: "IL - Chicago")A#(20);87.75)L(20);41.83)K(20)
263: "KY - Louisville")A#(21);85.75)L(21);38.2667)K(21)
264: "LA - New Orleans")A#(22);90.05)L(22);30)K(22)
265: "MA - Billerica")A#(23);71.223)L(23);42.538)K(23)
266: "MA - Boston")A#(24);71.063)L(24);42.36)K(24)
267: "MA - Rockport")A#(25);70.6)L(25);42.665)K(25)
268: "MA - Scituate")A#(26);70.72)L(26);42.2)K(26)
269: "MA - Siasconset")A#(27);69.97)L(27);41.25)K(27)
270: "MA - West Yarmouth")A#(28);70.22)L(28);41.68)K(28)
271: "MD - Baltimore")A#(29);76.6167)L(29);39.2833)K(29)
272: "MD - Ocean City")A#(30);75.1)L(30);38.35)K(30)
273: "ME - Bar Harbour")A#(31);68.23)L(31);44.33)K(31)
274: "ME - Portland")A#(32);70.2833)L(32);43.65)K(32)
275: "MI - Detroit")A#(33);83.08)L(33);42.38)K(33)
276: "MN - Duluth")A#(34);92.1)L(34);46.7833)K(34)
277: "NC - Buxton(C.Hatteras)"A#(35);75.53)L(35);35.27)K(35)
278: "NC - Cape Fear")A#(36);78)L(36);33.8833)K(36)
279: "NH - Mt. Washington")A#(37);71.31)L(37);44.275)K(37)
280: "NJ - Cape May")A#(38);74.95)L(38);38.93)K(38)
281: "NJ - Tom's River")A#(39);74.2)L(39);39.9667)K(39)
282: "NY - Albany")A#(40);73.75)L(40);42.65)K(40)
283: "NY - Buffalo")A#(41);78.82)L(41);42.9)K(41)
284: "NY - Montauk, LI")A#(42);71.85)L(42);41.07)K(42)
285: "NY - New York City")A#(43);73.83)L(43);40.67)K(43)
286: "NY - Syracuse")A#(44);76.15)L(44);43.05)K(44)
287: "OH - Cincinnati")A#(45);84.5)L(45);39.17)K(45)
288: "OH - Cleveland")A#(46);81.7)L(46);41.5)K(46)
289: "PA - Philadelphia")A#(47);75.2)L(47);40)K(47)
290: "PA - Pittsburgh")A#(48);80)L(48);40.45)K(48)
291: "RI - Newport")A#(49);71.31)L(49);41.47)K(49)
292: "SC - Charleston")A#(50);79.95)L(50);32.8)K(50)
293: "SC - Hilton Head Is.")A#(51);80.75)L(51);32.2)K(51)
294: "TN - Nashville")A#(52);86.8)L(52);36.15)K(52)
295: "TX - Brownsville")A#(53);97.5)L(53);25.9)K(53)
296: "TX - Houston")A#(54);95.4)L(54);29.75)K(54)
297: "VA - Norfolk")A#(55);76.3)L(55);36.9)K(55)
298: ret
299: "TABLE3":% Trans-Atlantic
300: for Z=2 to 55
301: "E")L#(Z);"W")K#(Z)
302: next Z
303: "MA-Eastham")A#(2);69.9667)L(2);"W")L#(2);41.8167)K(2)
304: "NF-Cape Race")A#(3);53)L(3);"W")L#(3);46.7)K(3)
305: "ALBANIA-Tirana")A#(4);19.82)L(4);41.33)K(4)
306: "ALGERIA-Algiers")A#(5);3)L(5);36.83)K(5)
307: "ANGOLA-Luanda")A#(6);13.25)L(6);8.83)K(6);"S")K#(6)
308: "ASCENSION IS.")A#(7);14.37)L(7);"W")L#(7);7.95)K(7);"S")K#(7)
309: "AUSTRIA-Vienna")A#(8);16.37)L(8);48.22)K(8)
310: "AZORES-Flora")A#(9);31.2)L(9);"W")L#(9);39.4)K(9)
311: "BELGIUM-Brussels")A#(10);4.35)L(10);50.83)K(10)
312: "BULGARIA-Sofia")A#(11);23.3)L(11);42.67)K(11)
313: "CANARY IS.-S.C.deTenerife")A#(12);16.25)L(12);"W")L#(12)
314: "CANARY IS.-S.C.deTenerife")A#(12);28.47)K(12)
315: "CHINA-Urumqi")A#(13);87.63)L(13);43.72)K(13)
316: "CZECHOSLOVAKIA-Prague")A#(14);14.42)L(14);50.08)K(14)
317: "DENMARK-Esbjerg")A#(15);8.47)L(15);55.47)K(15)
318: "EGYPT-Cairo")A#(16);31.25)L(16);30.05)K(16)
319: "ENGLAND-London")A#(17);.17)L(17);"W")L#(17);51.5)K(17)
320: "ENGLAND-Penzance")A#(18);5.55)L(18);"W")L#(18);50.12)K(18)

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321: "FINLAND-Helsinki")A#[19];24.9667)L[19];60.1667)K[19]  
322: "FRANCE-Paris")A#[20];2.33)L[20];48.87)K[20]  
323: "GERMANY(W)-Langenberg")A#[21];7.12)L[21];51.37)K[21]  
324: "GREECE-Athens")A#[22];23.73)L[22];38)K[22]  
325: "GREENLAND-C. Farøe")A#[23];43.67)L[23];"W":L#[23];59.83)K[23]  
326: "HOLLAND-Hilversum")A#[24];5.17)L[24];52.23)K[24]  
327: "HUNGARY-Budapest")A#[25];19.05)L[25];47.5)K[25]  
328: "ICELAND-Reykjavik")A#[26];21.97)L[26];"W":L#[26];64.15)K[26]  
329: "INDIA-New Delhi")A#[27];77.22)L[27];28.62)K[27]  
330: "IRAN-Teheran")A#[28];51.43)L[28];35.67)K[28]  
331: "IRELAND-Brandon Mt.")A#[29];10.25)L[29];"W":L#[29];52.23)K[29]  
332: "ISRAEL-Tel Aviv")A#[30];34.77)L[30];32.08)K[30]  
333: "ITALY-Rome")A#[31];12.5)L[31];41.88)K[31]  
334: "KENYA-Nairobi")A#[32];36.83)L[32];1.28)K[32];"S")K#[32]  
335: "KUWAIT")A#[33];47.88)L[33];29.26)K[33]  
336: "MONACO-Monte Carlo")A#[34];7.43)L[34];43.73)K[34]  
337: "MOFOCCO-Rabat")A#[35];6.85)L[35];"W":L#[35];34.03)K[35]  
338: "NIGERIA-Lagos")A#[36];3.47)L[36];6.45)K[36]  
339: "NORWAY-Hammerfest")A#[37];23.7)L[37];70.6667)K[37]  
340: "NORWAY-Kvitsoy")A#[38];5.43)L[38];59.07)K[38]  
341: "OMAN")A#[39];56.75)L[39];18.83)K[39]  
342: "POLAND-Warsaw")A#[40];21)L[40];52.25)K[40]  
343: "PORTUGAL-Lisbon")A#[41];9.13)L[41];"W":L#[41];38.73)K[41]  
344: "ROMANIA-Bucharest")A#[42];26.12)L[42];44.42)K[42]  
345: "SAUDI ARABIA-Duba")A#[43];35.77)L[43];27.32)K[43]  
346: "SCOTLAND-John O'Groats")A#[44];3.03)L[44];"W":L#[44];58.65)K[44]  
347: "SENEGAL-Dakar")A#[45];17.45)L[45];"W":L#[45];14.63)K[45]  
348: "SOUTH AFRICA-Cape Town")A#[46];18.47)L[46];33.93)K[46];"S")K#[46]  
349: "SPAIN-Madrid")A#[47];3.72)L[47];"W":L#[47];40.42)K[47]  
350: "SWEDEN-Stockholm")A#[48];18.05)L[48];59.3333)K[48]  
351: "SWITZERLAND-Zurich")A#[49];8.55)L[49];47.38)K[49]  
352: "TRISTAN DA CUNHA")A#[50];12.5)L[50];"W":L#[50];37.25)K[50];"S")K#[50]  
353: "TURKEY-Istanbul")A#[51];28.95)L[51];41.03)K[51]  
354: "USSR-Moscow")A#[52];37.7)L[52];55.75)K[52]  
355: "USSR-Riga")A#[53];24.1)L[53];56.95)K[53]  
356: "USSR-Yerevan")A#[54];44.52)L[54];40.17)K[54]  
357: "YUGOSLAVIA-Zagreb")A#[55];15.9667)L[55];45.8)K[55]  
358: ret  
359: "TABLE4":% LatinAmerica/Caribbean  
360: for Z=2 to 55  
361: "W":L#[Z];"N")K#[Z]  
362: next Z  
363: "ANTIGUA-St. John's")A#[2];61.85)L[2];17.12)K[2]  
364: "ARGENTINA-Buenos Aires")A#[3];58.5)L[3];34.67)K[3];"S")K#[3]  
365: "ARGENTINA-Ushuaia")A#[4];68.32)L[4];54.8)K[4];"S")K#[4]  
366: "BAHAMAS-Nassau")A#[5];77.35)L[5];25.0833)K[5]  
367: "BARBADOS-Bridgetown")A#[6];59.62)L[6];13.1)K[6]  
368: "BELIZE-Belize City")A#[7];88.17)L[7];17.48)K[7]  
369: "BERMUDA-Hamilton")A#[8];64.8)L[8];32.3)K[8]  
370: "BOLIVIA-La Paz")A#[9];68.05)L[9];16.5)K[9];"S")K#[9]  
371: "BRASIL-Belem")A#[10];48)L[10];2)K[10];"S")K#[10]  
372: "BRASIL-Brazilia")A#[11];47.9167)L[11];15.7833)K[11];"S")K#[11]  
373: "BRASIL-Manaus")A#[12];60)L[12];3.13)K[12];"S")K#[12]  
374: "BRASIL-Natal")A#[13];35.25)L[13];5.77)K[13];"S")K#[13]  
375: "BRASIL-Parnaiba")A#[14];41.7833)L[14];2.9)K[14];"S")K#[14]  
376: "BRASIL-Rio de Janeiro")A#[15];43.28)L[15];22.88)K[15];"S")K#[15]  
377: "CAYMAN IS.")A#[16];81.25)L[16];19.3333)K[16]  
378: "CHILE-Valparaiso")A#[17];71.67)L[17];33.08)K[17];"S")K#[17]  
379: "COLOMBIA-Barranquilla")A#[18];74.83)L[18];11)K[18]  
380: "COLOMBIA-Bogota")A#[19];74.08)L[19];4.63)K[19]  
381: "COSTA RICA-San Jose")A#[20];84.07)L[20];9.98)K[20]  
382: "CUBA-Havana")A#[21];82.42)L[21];23.12)K[21]  
383: "DOMINICA")A#[22];61.08)L[22];15.4)K[22]  
384: "DOMINICAN REP.")A#[23];69.91)L[23];18.5)K[23]  
385: "ECUADOR-Quito")A#[24];78.5)L[24];.23)K[24];"S")K#[24]  
386: "EL SALVADOR")A#[25];89.18)L[25];13.75)K[25]  
387: "FALL LANDS IS.-Stanley")A#[26];57.93)L[26];51.75)K[26];"S")K#[26]  
388: "GALAPAGOS IS.")A#[27];90.5)L[27];.5)K[27];"S")K#[27]  
389: "GRENADA")A#[28];61.76)L[28];12.01)K[28]  
390: "GUADELOUPE")A#[29];61.31)L[29];16.11)K[29]  
391: "GUATEMALA")A#[30];90.53)L[30];14.61)K[30]  
392: "GUYANA")A#[31];58.08)L[31];6.81)K[31]  
393: "HAITI")A#[32];72.33)L[32];18.58)K[32]  
394: "HONDURAS")A#[33];87.25)L[33];14.13)K[33]  
395: "JAMAICA")A#[34];77.51)L[34];18.35)K[34]  
396: "MEXICO-Acapulco")A#[35];99.9167)L[35];16.85)K[35]  
397: "MEXICO-Cabo San Lucas")A#[36];110)L[36];22.8)K[36]  
398: "MEXICO-Mexico City")A#[37];99.17)L[37];19.42)K[37]  
399: "MEXICO-Puerto Juarez Yuc.")A#[38];86.83)L[38];21.17)K[38]  
400: "MEXICO-Tijuana")A#[39];117.0167)L[39];32.5333)K[39]  
401: "NETH. ANTILLES-Bonaire")A#[40];68.25)L[40];12.1667)K[40]  
402: "NICARAGUA-Managua")A#[41];86.3)L[41];12.1)K[41]  
403: "PANAMA-Panama City")A#[42];79.5)L[42];8.95)K[42]

404: "PARAGUAY-Asuncion")A#[43];57.6567)L[43];25.2667)K[43];"S")K#[43]  
405: "PERU-Lima")A#[44];77.05)L[44];12.1)K[44];"S")K#[44]  
406: "PUERTO RICO-San Juan")A#[45];66.13)L[45];18.48)K[45]  
407: "SAINT KITTS")A#[46];62.41)L[46];17.4)K[46]  
408: "SOUTH POLE")A#[47];0)L[47];90)K[47];"S")K#[47]  
409: "SURINAM-Paramaribo")A#[48];55.23)L[48];5.87)K[48]  
410: "SWAN IS.")A#[49];83.9167)L[49];17.4167)K[49]  
411: "TRINIDAD-Port of Spain")A#[50];61.52)L[50];10.63)K[50]  
412: "URUGUAY")A#[51];56.16)L[51];34.83)K[51];"S")K#[51]  
413: "VENEZUELA-Caracas")A#[52];66.93)L[52];10.58)K[52]  
414: "VENEZUELA-La Asuncion")A#[53];63.8833)L[53];11.0333)K[53]  
415: "VENEZUELA-Maracaibo")A#[54];71.6167)L[54];10.6667)K[54]  
416: "VIRGIN IS.-Roadtown")A#[55];64.65)L[55];18.47)K[55]  
417: ret  
418: "TABLE5":% westernN.America/Pacific/E.Asia/Down-Under  
419: for Z=2 to 27  
420: "M":L#[Z];"N")K#[Z]  
421: next Z  
422: "AB - Calgary")A#[2];114.0833)L[2];51.05)K[2]  
423: "BC - Vancouver")A#[3];123.12)L[3];49.27)K[3]  
424: "SK - Regina")A#[4];104.63)L[4];50.5)K[4]  
425: "YT - Elsa")A#[5];135.48)L[5];63.92)K[5]  
426: "AK - Anchorage")A#[6];150)L[6];61.17)K[6]  
427: "AK - Juneau")A#[7];134.25)L[7];58.5)K[7]  
428: "AK - Nome")A#[8];165.5)L[8];63.67)K[8]  
429: "AZ - Phoenix")A#[9];112.05)L[9];33.5)K[9]  
430: "CA - Crescent City")A#[10];124.22)L[10];41.77)K[10]  
431: "CA - Los Angeles")A#[11];118.25)L[11];34)K[11]  
432: "CA - San Francisco")A#[12];122.45)L[12];37.75)K[12]  
433: "CO - Denver")A#[13];105)L[13];39.75)K[13]  
434: "HI - Honolulu")A#[14];157.83)L[14];21.32)K[14]  
435: "ID - Boise")A#[15];116.2167)L[15];43.6167)K[15]  
436: "MN - Minneapolis")A#[16];93.2167)L[16];44.9833)K[16]  
437: "MO - St. Louis")A#[17];90.1833)L[17];38.6333)K[17]  
438: "MT - Billings")A#[18];118.45)L[18];45.7833)K[18]  
439: "ND - Fargo")A#[19];96.8)L[19];46.8667)K[19]  
440: "NE - Omaha")A#[20];95.95)L[20];41.2667)K[20]  
441: "NM - Albuquerque")A#[21];106.6667)L[21];35.0833)K[21]  
442: "NV - Las Vegas")A#[22];115.2)L[22];36.2)K[22]  
443: "OR - Seaside")A#[23];123.9)L[23];46)K[23]  
444: "TX - Dallas")A#[24];96.8)L[24];32.78)K[24]  
445: "UT - Salt Lake City")A#[25];111.92)L[25];40.75)K[25]  
446: "WA - La Push")A#[26];124.6333)L[26];47.9167)K[26]  
447: "WA - Seattle")A#[27];122.33)L[27];47.58)K[27]  
448: for Z=28 to 55  
449: "E":L#[Z];"N")K#[Z]  
450: next Z  
451: "AUSTRALIA-Melbourne")A#[28];144.9667)L[28];37.8167)K[28];"S")K#[28]  
452: "AUSTRALIA-Perth")A#[29];115.82)L[29];31.97)K[29];"S")K#[29]  
453: "AUSTRALIA-Rockhampton")A#[30];150.517)L[30];23.383)K[30];"S")K#[30]  
454: "CHINA-Beijing")A#[31];116.42)L[31];39.92)K[31]  
455: "CHINA-Shanghai")A#[32];121.4667)L[32];31.2333)K[32]  
456: "N. MAGNETIC POLE")A#[33];101.5)L[33];"W":L#[33];76.25)K[33]  
457: "EASTER ISLAND")A#[34];109.33)L[34];"W":L#[34];27.08)K[34];"S")K#[34]  
458: "FIJI")A#[35];178.66)L[35];18.16)K[35];"S")K#[35]  
459: "GUAM")A#[36];143.33)L[36];14)K[36]  
460: "HONG KONG")A#[37];114.26)L[37];22.25)K[37]  
461: "INDIA - Calcutta")A#[38];88.5)L[38];22.5)K[38]  
462: "INDONESIA-Jakarta")A#[39];106.75)L[39];6.13)K[39];"S")K#[39]  
463: "JAPAN-Sapporo")A#[40];141.35)L[40];43.05)K[40]  
464: "JAPAN-Tokyo")A#[41];139.75)L[41];35.67)K[41]  
465: "KIRIBATI")A#[42];173)L[42];1.5)K[42];"S")K#[42]  
466: "KOREA(S)-Seoul")A#[43];126.9667)L[43];37.5)K[43]  
467: "MONGOLIA-Ulan Bator")A#[44];106.8833)L[44];47.9167)K[44]  
468: "NEW ZEALAND-Te Anara")A#[45];178.42)L[45];37.63)K[45];"S")K#[45]  
469: "NORTH POLE")A#[46];0)L[46];90)K[46]  
470: "PAPUA N.G.-Port Moresby")A#[47];147.1667)L[47];9.5)K[47];"S")K#[47]  
471: "PHILIPPINES-Manila")A#[48];120.98)L[48];14.6)K[48]  
472: "PITCAIRN IS.")A#[49];130.0833)L[49];"W":L#[49]  
473: "PITCAIRN IS.")A#[49];125.0667)K[49];"S")K#[49]  
474: "TAHITI-Papeete")A#[50];149.57)L[50];"W":L#[50];17.53)K[50];"S")K#[50]  
475: "TAIWAN")A#[51];121.4)L[51];25.15)K[51]  
476: "THAILAND")A#[52];100.48)L[52];13.83)K[52]  
477: "TIBET-Lhasa")A#[53];91.17)L[53];29.68)K[53]  
478: "USSR-Khabarovsk")A#[54];135.1)L[54];48.45)K[54]  
479: "USSR-Petropavlovsk")A#[55];158.65)L[55];53.02)K[55]  
480: ret  
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