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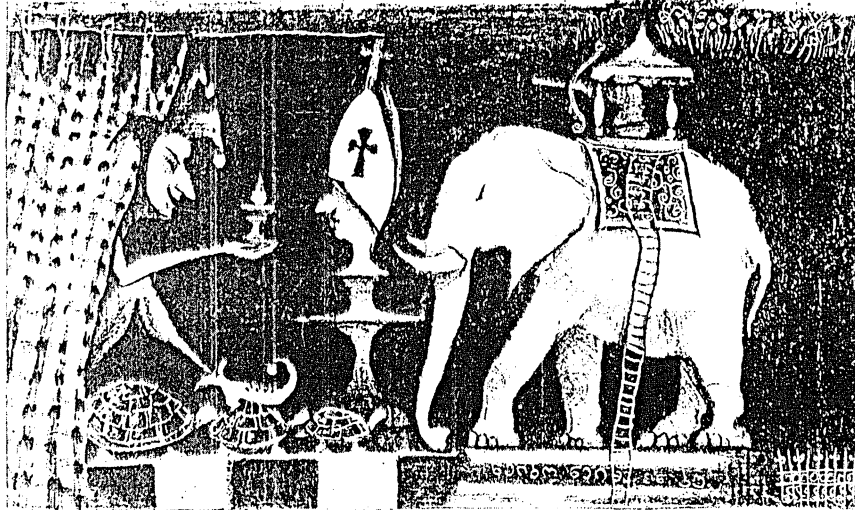
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July 1999

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The Bishop - drawing by Neiko Neidze

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\*C\* Lars Rasmussen +computer lists all the reciprocal zugzwangs in the GBR class **0040.10**. Depth figures are to 'ultimate', not to 'conversion'.

1: wKc8, Ba8, Pb7; bKd6, Bc7 =/10  
 2: wKb8, Ba5, Pc7; bKa6, Bb7 =/11  
 3: wKb8, Bd8, Pc7; bKa6, Bb7 =/ 9  
 4: wKd6, Bd7, Pc7; bKb7, Bc8 =/ 7  
 5: wKd8, Bb8, Pc7; bKe6, Bd7 =/10  
 6: wKe1, Bd1, Pc7; bKc1, Bc8 =/33  
 7: wKf2, Be2, Pc7; bKd2, Bc8 =/31  
 8: wKf2, Bf1, Pc7; bKd2, Bb7 =/30  
 9: wKf2, Bf3, Pc7; bKd2, Ba6 =/32  
 10: wKf2, Bh3, Pc7; bKd2, Ba6 =/31  
 11: wKg3, Bg4, Pc7; bKg5, Ba6 =/19  
 12: wKg3, Bh3, Pc7; bKg5, Bb7 =/18  
 13: wKa8, Bc8, Pd7; bKc7, Bb8 =/ 9  
 14: wKa8, Be8, Pd7; bKc7, Bb8 =/ 9  
 15: wKb6, Bc6, Pd7; bKd8, Ba8 =/10  
 16: wKc6, Bc7, Pd7; bKe7, Bd8 =/ 9  
 17: wKc8, Be8, Pd7; bKb6, Bc7 =/ 9  
 18: wKd3, Bd8, Pd7; bKb3, Bc3 =/25  
 19: wKe2, Bd8, Pd7; bKc2, Bd2 =/27  
 20: wKe4, Bd8, Pd7; bKe2, Be1 =/20  
 21: wKe6, Be7, Pd7; bKc7, Bd8 =/ 8  
 22: wKe8, Bc8, Pd7; bKf6, Be7 =/ 9  
 23: wKf1, Bd8, Pd7; bKd1, Be1 =/29  
 24: wKf3, Bd8, Pd7; bKf1, Bc3 =/21  
 25: wKf3, Bd8, Pd7; bKh1, Bc3 =/20  
 26: wKg6, Bf6, Pd7; bKf8, Be7 =/ 3  
 27: wKa8, Bb7, Pa6; bKb6, Ba7 =/11  
 28: wKa8, Bb7, Pa6; bKc7, Bb8 =/10  
 29: wKc6, Bb7, Pa6; bKb8, Ba8 =/ 5  
 30: wKg4, Bg5, Pa6; bKg6, Ba7 =/22  
 31: wKg4, Bh4, Pa6; bKg6, Bb8 =/21  
 32: wKh5, Bh6, Pa6; bKh7, Ba7 =/24  
 33: wKa5, Ba6, Pb6; bKc6, Bb7 =/21  
 34: wKd2, Bd1, Pb6; bKb2, Ba6 =/22  
 35: wKd6, Be6, Pb6; bKd8, Bb7 =/22  
 36: wKg5, Bh5, Pb6; bKg7, Bc8 =/19  
 37: wKh6, Bh7, Pb6; bKh8, Bb7 =/21  
 38: wKa4, Be8, Pc6; bKc4, Bc8 =/26  
 39: wKa5, Ba4, Pc6; bKc5, Bc8 =/24  
 40: wKa5, Be8, Pc6; bKc5, Bc8 =/25  
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 42: wKa8, Bb5, Pc6; bKc7, Bb8 =/12  
 43: wKa8, Bb7, Pc6; bKc7, Bb8 =/10  
 44: wKa8, Bd7, Pc6; bKc7, Bb8 =/11

45: wKb6, Bc7, Pc6; bKa8, Bb8 =/26  
 46: wKc2, Bc1, Pc6; bKa2, Be5 =/27  
 47: wKc2, Bc7, Pc6; bKe2, Be1 =/22  
 48: wKd3, Bc7, Pc6; bKf3, Bf6 =/21  
 49: wKd6, Bc7, Pc6; bKe8, Bd8 =/20  
 50: wKe1, Bd1, Pc6; bKc1, Be6 =/34  
 51: wKf2, Be2, Pc6; bKd2, Be6 =/32  
 52: wKf2, Bg4, Pc6; bKd2, Ba6 =/33  
 53: wKf7, Bc7, Pc6; bKf5, Bb4 =/22  
 54: wKh5, Bc7, Pc6; bKh7, Be7 =/20  
 55: wKd5, Bh4, Pd6; bKb3, Ba5 =/22  
 56: wKh8, Be7, Pd6; bKf7, Bg8 =/11  
 57: wKa1, Ba2, Pa5; bKc1, Bd3 =/28  
 58: wKc7, Bb6, Pa5; bKa6, Ba7 =/13  
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 60: wKf6, Bb5, Pa5; bKf8, Bc8 =/16  
 61: wKg4, Bg5, Pa5; bKg6, Bb8 =/23  
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 63: wKh5, Bh6, Pa5; bKh7, Bb8 =/25  
 64: wKh6, Bb5, Pa5; bKh8, Bc8 =/18  
 65: wKh6, Bf7, Pa5; bKh8, Bd3 =/23  
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 68: wKa8, Ba4, Pb5; bKb6, Ba7 =/13  
 69: wKa8, Ba6, Pb5; bKb6, Ba7 =/11  
 70: wKa8, Ba6, Pb5; bKc7, Bb8 =/12  
 71: wKd8, Be8, Pb5; bKd6, Bb7 =/23  
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 73: wKf5, Bb6, Pb5; bKf3, Bc3 =/37  
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 76: wKg5, Bg6, Pb5; bKg7, Bc8 =/21  
 77: wKg6, Bb6, Pb5; bKg2, Bc3 =/39  
 78: wKh3, Bf2, Pb5; bKh1, Bc7 =/23  
 79: wKh5, Bb6, Pb5; bKh3, Bc3 =/39  
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 82: wKh7, Bb6, Pb5; bKh1, Bc3 =/41  
 83: wKc1, Bb3, Pc5; bKa1, Be4 =/44  
 84: wKd2, Bc6, Pc5; bKf2, Bf1 =/40  
 85: wKd5, Bb8, Pc5; bKf3, Bd8 =/22  
 86: wKf2, Bc6, Pc5; bKh2, Bh3 =/31  
 87: wKf3, Ba7, Pc5; bKh1, Bh2 =/21  
 88: wKf4, Bb5, Pc5; bKf2, Bb7 =/36  
 89: wKf5, Bg6, Pc5; bKg7, Bf3 =/31  
 90: wKg3, Bb5, Pc5; bKg1, Bb7 =/36  
 91: wKg4, Bb5, Pc5; bKg2, Bb7 =/37  
 92: wKg5, Bh5, Pc5; bKg7, Bd7 =/32

93: wKh3, Bb5, Pc5; bKh1, Bb7 =/37  
 94: wKh4, Bb5, Pc5; bKh2, Bb7 =/44  
 95: wKh4, Bc6, Pc5; bKh2, Bc8 =/43  
 96: wKa8, Bb7, Pd5; bKb6, Ba7 =/14  
 97: wKa8, Bc4, Pd5; bKb6, Ba7 =/14  
 98: wKa8, Bc6, Pd5; bKb6, Ba7 =/16  
 99: wKa8, Bb7, Pd5; bKc7, Bb8 =/14  
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 101: wKa8, Bc6, Pd5; bKc7, Bb8 =/13  
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 103: wKe5, Ba6, Pd5; bKg3, Bd7 =/26  
 104: wKe5, Bc8, Pd5; bKg3, Ba4 =/21  
 105: wKe5, Bf5, Pd5; bKh4, Ba4 =/22  
 106: wKf5, Bc8, Pd5; bKg3, Bb5 =/23  
 107: wKf5, Bc6, Pd5; bKh4, Bb5 =/30  
 108: wKa8, Bb5, Pa4; bKb6, Ba7 =/13  
 109: wKd1, Bb6, Pa4; bKf1, Be1 =/23  
 110: wKe3, Bb4, Pa4; bKf1, Bc7 =/24  
 111: wKf1, Bg3, Pa4; bKh1, Bb6 =/27  
 112: wKf3, Bb4, Pa4; bKf1, Bd8 =/25  
 113: wKg3, Bb4, Pa4; bKg1, Bd8 =/26  
 114: wKg3, Bc5, Pa4; bKh1, Ba5 =/27  
 115: wKh3, Bb6, Pa4; bKh1, Be1 =/26  
 116: wKa3, Bc4, Pb4; bKc4, Ba2 =/36  
 117: wKc2, Bc3, Pb4; bKa3, Bb2 =/23  
 118: wKc4, Bc6, Pb4; bKb2, Bc2 =/31  
 119: wKd4, Bc6, Pb4; bKb2, Bd1 =/30  
 120: wKe1, Bd5, Pb4; bKg1, Bb5 =/32  
 121: wKh4, Bc6, Pb4; bKh2, Bd1 =/33  
 122: wKh4, Bd5, Pb4; bKh2, Be2 =/32  
 123: wKa8, Bb5, Pc4; bKb6, Ba7 =/13  
 124: wKb6, Bd5, Pc4; bKb4, Ba8 =/13  
 125: wKf2, Bd7, Pc4; bKh2, Bg2 =/33  
 126: wKf4, Bb5, Pc4; bKg2, Bb7 =/42  
 127: wKg3, Bb5, Pc4; bKh1, Bb7 =/37  
 128: wKg5, Bg6, Pc4; bKg7, Bd7 =/35  
 129: wKa1, Bb2, Pd4; bKb3, Ba2 =/17  
 130: wKf7, Be5, Pd4; bKh7, Bg7 =/20  
 131: wKe3, Bb4, Pa3; bKf1, Bg3 =/27  
 132: wKg3, Bb4, Pa3; bKg1, Bf6 =/30  
 133: wKg6, Bb4, Pa3; bKg8, Bf8 =/21  
 134: wKa1, Ba2, Pb3; bKc2, Bb1 =/20  
 135: wKc1, Bc2, Pb3; bKa2, Bb1 =/27  
 136: wKc6, Bc5, Pb3; bKa5, Bd8 =/23  
 137: wKa1, Bb2, Pc3; bKb3, Ba2 =/17  
 138: wKa1, Bb4, Pc3; bKb3, Ba2 =/17  
 139: wKa1, Bd2, Pc3; bKb3, Ba2 =/19  
 140: wKa1, Bb2, Pc3; bKc2, Bb1 =/18

141: wKb1, Bb2, Pc3; bKd2, Bc1 =/19  
 142: wKd1, Bd2, Pc3; bKb2, Bc1 =/18  
 143: wKf7, Bd4, Pc3; bKh7, Bg7 =/19  
 144: wKc1, Bc2, Pd3; bKe2, Bd1 =/19  
 145: wKe1, Be2, Pd3; bKc2, Bd1 =/19  
 146: wKf2, Bc4, Pd3; bKd2, Bb1 =/17  
 147: wKf6, Bc4, Pd3; bKh6, Bg6 =/22  
 148: wKc1, Bb3, Pa2; bKa1, Bc2 =/25  
 149: wKc4, Bf4, Pa2; bKe2, Ba3 =/27  
 150: wKe3, Bc4, Pa2; bKe1, Ba4 =/25  
 151: wKe3, Bd3, Pa2; bKe1, Bd1 =/26  
 152: wKf3, Bc7, Pa2; bKg1, Ba3 =/29  
 153: wKg3, Ba5, Pa2; bKg1, Ba3 =/31  
 154: wKg3, Bc7, Pa2; bKh1, Ba3 =/30  
 155: wKa5, Ba4, Pb2; bKc4, Bb3 =/31  
 156: wKc3, Bb3, Pb2; bKc1, Bc2 =/29  
 157: wKe3, Bc6, Pb2; bKf1, Bb3 =/31  
 158: wKa1, Bc1, Pd2; bKb3, Ba2 =/18  
 159: wKa1, Bc3, Pd2; bKb3, Ba2 =/19  
 160: wKb3, Bc3, Pd2; bKd3, Ba1 =/18

\*C\* Lars Rasmussen's computer lists all the reciprocal zugzwangs in the GBR class **0031.10**. Depth figures are 'ultimate', not to 'conversion'.

1: wKa8, Sf7, Pa7; bKc7, Bg8 2/=  
 2: wKb1, Sc8, Pa7; bKd1, Bc6 =/27  
 3: wKb2, Sc8, Pa7; bKd2, Bc6 =/26  
 4: wKb3, Sc8, Pa7; bKd3, Bc6 =/25  
 5: wKb4, Sc8, Pa7; bKd4, Bc6 =/24  
 6: wKb6, Sb4, Pa7; bKa8, Bb7 =/ 2  
 7: wKb6, Sb4, Pa7; bKa8, Bc4 =/ 2  
 8: wKb6, Sc3, Pa7; bKa8, Bc4 =/ 2  
 9: wKb6, Sc3, Pa7; bKa8, Bc6 =/ 2  
 10: wKb6, Sc5, Pa7; bKa8, Bc4 =/ 2  
 11: wKb6, Sc5, Pa7; bKa8, Bc8 =/ 2  
 12: wKb6, Sd4, Pa7; bKa8, Bc4 =/ 2  
 13: wKb6, Sd4, Pa7; bKa8, Bd7 =/ 2  
 14: wKb6, Sf6, Pa7; bKa8, Bc6 =/ 2  
 15: wKb6, Sf6, Pa7; bKa8, Bf7 =/ 2  
 16: wKb6, Sg7, Pa7; bKa8, Bd7 =/ 2  
 17: wKb6, Sg7, Pa7; bKa8, Bf7 =/ 2  
 18: wKb6, Sc1, Pa7; bKc4, Ba8 =/27  
 19: wKb6, Sd3, Pa7; bKd5, Ba8 =/22  
 20: wKb6, Sc5, Pa7; bKd6, Ba8 =/21  
 21: wKb8, Sa8, Pa7; bKa6, Bd8 =/15  
 22: wKb8, Sa4, Pa7; bKc6, Bb7 =/11  
 23: wKb8, Sd5, Pa7; bKc6, Bb7 =/11

24: wKb8, Sd7, Pa7; bKc6, Bb7 =/12  
25: wKb8, Sd4, Pa7; bKd6, Ba8 =/17  
26: wKb8, Sd8, Pa7; bKd6, Ba8 =/14  
27: wKb8, Sa6, Pa7; bKd7, Ba8 =/15  
28: wKb8, Sb3, Pa7; bKd7, Ba8 =/15  
29: wKb8, Sb7, Pa7; bKd7, Ba8 =/12  
30: wKb8, Sd3, Pa7; bKd7, Ba8 =/15  
31: wKb8, Se6, Pa7; bKd7, Ba8 =/15  
32: wKb8, Sa5, Pa7; bKd8, Ba8 =/13  
33: wKb8, Sc5, Pa7; bKd8, Ba8 =/13  
34: wKb8, Sd4, Pa7; bKd8, Ba8 =/16  
35: wKb8, Sd6, Pa7; bKd8, Ba8 =/13  
36: wKb8, Sf4, Pa7; bKd8, Ba8 =/16  
37: wKb8, Sf8, Pa7; bKd8, Ba8 =/16  
38: wKb8, Sg5, Pa7; bKd8, Ba8 =/16  
39: wKb8, Sg7, Pa7; bKd8, Ba8 =/16  
40: wKc1, Sd8, Pa7; bKe1, Ba8 =/30  
41: wKc2, Sd8, Pa7; bKe2, Ba8 =/28  
42: wKc3, Sd8, Pa7; bKe3, Ba8 =/26  
43: wKc4, Sd8, Pa7; bKe4, Ba8 =/24  
44: wKc5, Sd8, Pa7; bKe5, Ba8 =/22  
45: wKc7, Sh6, Pa7; bKe6, Ba8 =/22  
46: wKd6, Se5, Pa7; bKd4, Ba8 =/20  
47: wKd6, Sb6, Pa7; bKd8, Bb7 =/18  
48: wKd6, Sg4, Pa7; bKe4, Ba8 =/26  
49: wKd6, Sd5, Pa7; bKe8, Bb7 =/19  
50: wKe1, Sf2, Pa7; bKg1, Ba8 =/31  
51: wKe1, Sf1, Pa7; bKg2, Bf3 =/35  
52: wKe2, Sf2, Pa7; bKg2, Ba8 =/29  
53: wKe3, Sf2, Pa7; bKg3, Ba8 =/27  
54: wKe4, Sd5, Pa7; bKg6, Bb7 =/25  
55: wKe5, Sd5, Pa7; bKf7, Bb7 =/21  
56: wKe6, Se5, Pa7; bKe4, Ba8 =/22  
57: wKe6, Sb6, Pa7; bKe8, Bb7 =/19  
58: wKe7, Sa6, Pa7; bKe5, Bc6 =/27  
59: wKf4, Sc1, Pa7; bKf2, Ba8 =/25  
60: wKf4, Sd4, Pa7; bKf2, Ba8 =/24  
61: wKf4, Sg3, Pa7; bKf2, Ba8 =/26  
62: wKf6, Se5, Pa7; bKf4, Ba8 =/24  
63: wKf7, Sa6, Pa7; bKf5, Bc6 =/28  
64: wKg4, Sg3, Pa7; bKg2, Ba8 =/28  
65: wKg7, Sa6, Pa7; bKg5, Bc6 =/29  
66: wKh4, Sg3, Pa7; bKh2, Ba8 =/30  
67: wKh7, Sa6, Pa7; bKh5, Bc6 =/30  
68: wKa6, Sd7, Pb7; bKb4, Bh2 =/26  
69: wKa6, Sb3, Pb7; bKb8, Bb6 =/20  
70: wKa6, Sc8, Pb7; bKb8, Bc5 =/18  
71: wKa6, Se4, Pb7; bKb8, Bc7 =/16

72: wKa6, Sf5, Pb7; bKb8, Bc5 =/19  
73: wKa6, Sf7, Pb7; bKb8, Bf6 =/17  
74: wKa6, Sh7, Pb7; bKb8, Be7 =/16  
75: wKa6, Sc4, Pb7; bKc7, Bd4 =/18  
76: wKa6, Sd3, Pb7; bKc7, Bd4 =/18  
77: wKa6, Sf7, Pb7; bKc7, Bd4 =/18  
78: wKa6, Sg6, Pb7; bKc7, Bd4 =/18  
79: wKa8, Sd4, Pb7; bKa6, Ba4 =/15  
80: wKa8, Sd4, Pb7; bKg4, Be5 =/25  
81: wKb5, Sf3, Pb7; bKc3, Bb8 =/25  
82: wKb6, Se7, Pb7; bKc4, Bb8 =/20  
83: wKb8, Sd4, Pb7; bKb6, Ba4 =/16  
84: wKb8, Sa7, Pb7; bKc5, Bb6 =/19  
85: wKc4, Sd3, Pb7; bKe4, Ba7 =/22  
86: wKc6, Sc7, Pb7; bKa7, Bb8 =/4  
87: wKc6, Sg6, Pb7; bKb8, Bg7 =/18  
88: wKc6, Sc8, Pb7; bKc4, Bb8 =/22  
89: wKc6, Sg2, Pb7; bKd4, Bb8 =/25  
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91: wKc6, Sb3, Pb7; bKd8, Ba7 =/21  
92: wKc6, Sc5, Pb7; bKd8, Bb8 =/20  
93: wKc6, Sd3, Pb7; bKd8, Ba7 =/21  
94: wKc6, Se4, Pb7; bKd8, Ba7 =/21  
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96: wKc6, Sd8, Pb7; bKe5, Bb8 =/18  
97: wKc7, Sd5, Pb7; bKb5, Ba7 =/22  
98: wKc7, Sd7, Pb7; bKb5, Ba7 =/16  
99: wKc7, Se8, Pb7; bKc5, Ba7 =/15  
100: wKc7, Sh5, Pb7; bKe5, Ba7 =/23  
101: wKc8, Sa5, Pb7; bKd6, Bc7 =/13  
102: wKd1, Sc4, Pb7; bKb1, Bf4 =/23  
103: wKd5, Sd7, Pb7; bKf5, Bh2 =/24  
104: wKd5, Sg8, Pb7; bKf5, Bb8 =/25  
105: wKd7, Sh5, Pb7; bKe5, Bd6 =/25  
106: wKe6, Sf5, Pb7; bKe4, Bb8 =/23  
107: wKe6, Sc6, Pb7; bKe8, Bc7 =/16  
108: wKe6, Sh4, Pb7; bKf4, Bb8 =/24  
109: wKe6, Se5, Pb7; bKf8, Bc7 =/18  
110: wKe7, Sf6, Pb7; bKe5, Ba7 =/25  
111: wKf1, Sg2, Pb7; bKh1, Bb8 =/26  
112: wKf2, Sg2, Pb7; bKh2, Bb8 =/25  
113: wKf3, Sg2, Pb7; bKh3, Bb8 =/24  
114: wKf4, Se5, Pb7; bKh6, Bc7 =/22  
115: wKf5, Se5, Pb7; bKg7, Bc7 =/20  
116: wKf6, Sc6, Pb7; bKf8, Bc7 =/18  
117: wKg4, Sh3, Pb7; bKg2, Bb8 =/26  
118: wKg6, Sh7, Pb7; bKg8, Ba7 =/20  
119: wKg8, Sd7, Pb7; bKg6, Bd6 =/23

120: wKh4, Sh3, Pb7; bKh2, Bb8 =/28  
 121: wKh8, Sd7, Pb7; bKh6, Bd6 =/24  
 122: wKa5, Sb5, Pc7; bKb7, Ba8 =/13  
 123: wKb6, Sa5, Pc7; bKc8, Bd5 =/20  
 124: wKb6, Sd8, Pc7; bKc8, Bd5 =/20  
 125: wKb6, Sf4, Pc7; bKc8, Bf7 =/14  
 126: wKb6, Sg5, Pc7; bKc8, Bd5 =/22  
 127: wKb6, Sg7, Pc7; bKc8, Bg6 =/16  
 128: wKb8, Sa8, Pc7; bKa6, Bb7 =/10  
 129: wKb8, Sh6, Pc7; bKa6, Bb7 =/16  
 130: wKb8, Sh8, Pc7; bKa6, Bb7 =/16  
 131: wKb8, Sb4, Pc7; bKb6, Bb7 =/10  
 132: wKb8, Sd8, Pc7; bKb6, Ba6 =/14  
 133: wKb8, Sf7, Pc7; bKb6, Bb7 =/15  
 134: wKb8, Sa2, Pc7; bKc6, Bb7 =/11  
 135: wKb8, Sd5, Pc7; bKc6, Bb7 =/11  
 136: wKc6, Sa7, Pc7; bKa5, Ba6 =/11  
 137: wKc6, Se3, Pc7; bKc8, Bd3 =/20  
 138: wKc6, Sg6, Pc7; bKc8, Bb4 =/11  
 139: wKc6, Sg8, Pc7; bKc8, Bb4 =/11  
 140: wKc8, Sd7, Pc7; bKb4, Bc6 =/19  
 141: wKc8, Sa2, Pc7; bKc6, Ba8 =/14  
 142: wKc8, Sd5, Pc7; bKc6, Ba8 =/17  
 143: wKc8, Sb7, Pc7; bKd5, Bc6 =/19  
 144: wKc8, Sg8, Pc7; bKg5, Bg2 =/25  
 145: wKd2, Se4, Pc7; bKf1, Bc8 =/28  
 146: wKd3, Sa4, Pc7; bKf3, Bc8 =/26  
 147: wKd3, Sd5, Pc7; bKf3, Bc8 =/24  
 148: wKd4, Sa4, Pc7; bKe2, Bc8 =/24  
 149: wKd4, Sa5, Pc7; bKe2, Ba6 =/25  
 150: wKd4, Sb4, Pc7; bKe2, Bb7 =/23  
 151: wKd4, Sb5, Pc7; bKe2, Bc8 =/26  
 152: wKd4, Sb6, Pc7; bKe2, Bb7 =/25  
 153: wKd4, Sc4, Pc7; bKe2, Bc8 =/24  
 154: wKd4, Sd5, Pc7; bKe2, Bc8 =/22  
 155: wKd4, Sd6, Pc7; bKe2, Bd7 =/25  
 156: wKd4, Se4, Pc7; bKe2, Bc8 =/26  
 157: wKd4, Se7, Pc7; bKe2, Bd7 =/21  
 158: wKd4, Sg6, Pc7; bKe2, Bc8 =/22  
 159: wKd4, Sc6, Pc7; bKf2, Bd7 =/22  
 160: wKd4, Sa4, Pc7; bKf4, Bc8 =/22  
 161: wKd4, Sd6, Pc7; bKf4, Bc6 =/23  
 162: wKd5, Sa4, Pc7; bKf5, Bc8 =/19  
 163: wKd6, Se3, Pc7; bKc8, Be4 =/19  
 164: wKd6, Sh6, Pc7; bKc8, Bh7 =/9  
 165: wKd6, Sa4, Pc7; bKf6, Bc8 =/18  
 166: wKd6, Sb4, Pc7; bKf6, Bb7 =/19  
 167: wKd6, Sb8, Pc7; bKf6, Bb7 =/19  
 168: wKd6, Sc3, Pc7; bKf6, Bb7 =/19  
 169: wKd8, Sd5, Pc7; bKb7, Bf5 =/15  
 170: wKd8, Sd1, Pc7; bKf3, Bh3 =/17  
 171: wKd8, Sf3, Pc7; bKf6, Bh3 =/16  
 172: wKe1, Se3, Pc7; bKg1, Ba6 =/27  
 173: wKe1, Sf4, Pc7; bKg1, Ba6 =/25  
 174: wKe1, Sh4, Pc7; bKg1, Bg4 =/27  
 175: wKe4, Sd5, Pc7; bKe2, Bb7 =/23  
 176: wKe5, Se7, Pc7; bKg5, Bg4 =/20  
 177: wKe5, Sf8, Pc7; bKg5, Bc8 =/19  
 178: wKf6, Sd6, Pc7; bKf8, Bd7 =/15  
 179: wKf6, Sf5, Pc7; bKg8, Bd7 =/18  
 180: wKg5, Sf5, Pc7; bKh7, Bd7 =/20  
 181: wKg6, Sd6, Pc7; bKg8, Bd7 =/18  
 182: wKa8, Sb6, Pd7; bKc7, Bb8 =/10  
 183: wKa8, Sc5, Pd7; bKc7, Bb8 =/9  
 184: wKa8, Se5, Pd7; bKc7, Bb8 =/11  
 185: wKa8, Sf6, Pd7; bKc7, Bb8 =/11  
 186: wKa8, Sf8, Pd7; bKc7, Bb8 =/10  
 187: wKb7, Sa7, Pd7; bKa5, Bb6 =/11  
 188: wKb7, Sf7, Pd7; bKa5, Bb6 =/14  
 189: wKc1, Sb7, Pd7; bKa1, Bb6 =/19  
 190: wKc2, Sb7, Pd7; bKa2, Bb6 =/18  
 191: wKc2, Sc6, Pd7; bKa2, Bb6 =/16  
 192: wKc3, Sc4, Pd7; bKa2, Be7 =/21  
 193: wKc3, Sb7, Pd7; bKa3, Bb6 =/13  
 194: wKc3, Sc6, Pd7; bKa3, Bb6 =/15  
 195: wKc4, Sa7, Pd7; bKa3, Bb6 =/15  
 196: wKc4, Sb4, Pd7; bKa3, Bb6 =/15  
 197: wKc4, Sb8, Pd7; bKa3, Bb6 =/15  
 198: wKc4, Se5, Pd7; bKa3, Bb6 =/15  
 199: wKc4, Se7, Pd7; bKa3, Bb6 =/15  
 200: wKc4, Sb7, Pd7; bKa4, Bb6 =/11  
 201: wKc4, Sc6, Pd7; bKa4, Bb6 =/14  
 202: wKc4, Sa6, Pd7; bKb2, Bb6 =/18  
 203: wKc5, Sc6, Pd7; bKa4, Bc7 =/13  
 204: wKc6, Sb7, Pd7; bKa7, Bb6 =/11  
 205: wKc6, Sb7, Pd7; bKb8, Bc7 =/5  
 206: wKc6, Se6, Pd7; bKb8, Ba5 =/7  
 207: wKc6, Sb3, Pd7; bKd8, Bb4 =/13  
 208: wKc6, Sc4, Pd7; bKd8, Bb4 =/12  
 209: wKc6, Sc4, Pd7; bKd8, Bc7 =/12  
 210: wKc6, Sd6, Pd7; bKd8, Bb6 =/10  
 211: wKc6, Sf5, Pd7; bKd8, Bg5 =/15  
 212: wKc6, Sg4, Pd7; bKd8, Bg7 =/13  
 213: wKc8, Sb2, Pd7; bKb6, Bc7 =/10  
 214: wKc8, Sc4, Pd7; bKc6, Bc7 =/9  
 215: wKc8, Sb2, Pd7; bKd6, Bc7 =/10

216: wKc8, Sd2, Pd7; bKd6, Bc7 =/10  
217: wKc8, Se5, Pd7; bKd6, Bc7 =/11  
218: wKd3, Sc4, Pd7; bKc1, Bh4 =/22  
219: wKd4, Se6, Pd7; bKb4, Ba5 =/15  
220: wKd5, Sa7, Pd7; bKa3, Bd8 =/18  
221: wKd5, Sc6, Pd7; bKa3, Bb6 =/15  
222: wKd5, Sd4, Pd7; bKa3, Bd8 =/16  
223: wKd5, Se6, Pd7; bKb5, Ba5 =/13  
224: wKd8, Sb2, Pd7; bKd6, Bb8 =/13  
225: wKd8, Sd2, Pd7; bKd6, Bb8 =/12  
226: wKd8, Sd4, Pd7; bKd6, Bd3 =/15  
227: wKd8, Se5, Pd7; bKd6, Bb8 =/16  
228: wKe4, Sd8, Pd7; bKf2, Bd6 =/19  
229: wKe6, Sd6, Pd7; bKc7, Bb2 =/13  
230: wKe6, Se4, Pd7; bKd8, Bf4 =/10  
231: wKe6, Sf3, Pd7; bKd8, Bf4 =/21  
232: wKe7, Sd4, Pd7; bKa4, Ba5 =/18  
233: wKe8, Sg7, Pd7; bKg4, Bf6 =/16  
234: wKf7, Sb7, Pd7; bKg5, Bf6 =/16  
235: wKf7, Sg7, Pd7; bKg5, Bf6 =/10  
236: wKg6, Se6, Pd7; bKg4, Bh4 =/17  
237: wKg6, Se6, Pd7; bKg8, Be7 =/15  
238: wKg6, Sg5, Pd7; bKh8, Be7 =/16  
239: wKg6, Sh6, Pd7; bKh8, Be7 =/9  
240: wKh6, Se6, Pd7; bKh8, Be7 =/16  
241: wKa1, Sa4, Pa6; bKc1, Bb8 =/21  
242: wKa2, Sa4, Pa6; bKc2, Bb8 =/20  
243: wKa2, Sb5, Pa6; bKc2, Bc5 =/22  
244: wKa2, Sd6, Pa6; bKc2, Bc6 =/25  
245: wKa3, Sd6, Pa6; bKc3, Bc6 =/24  
246: wKa7, Sb7, Pa6; bKb5, Ba8 =/13  
247: wKa8, Sb4, Pa6; bKb6, Ba7 =/12  
248: wKa8, Sc5, Pa6; bKb6, Ba7 =/13  
249: wKa8, Sa4, Pa6; bKc7, Bb8 =/15  
250: wKa8, Sc4, Pa6; bKc7, Bb8 =/15  
251: wKa8, Sc6, Pa6; bKc7, Bb8 =/13  
252: wKa8, Sd7, Pa6; bKc7, Bb8 =/13  
253: wKb4, Sc7, Pa6; bKd4, Bd7 =/26  
254: wKb6, Sd4, Pa6; bKb8, Bd7 =/9  
255: wKb6, Sf6, Pa6; bKb8, Bf7 =/10  
256: wKb6, Sg7, Pa6; bKb8, Bd7 =/9  
257: wKb6, Sc1, Pa6; bKc4, Bf3 =/30  
258: wKd5, Se4, Pa6; bKd3, Ba7 =/21  
259: wKd5, Sg3, Pa6; bKe3, Ba7 =/22  
260: wKd5, Sh3, Pa6; bKe3, Bb8 =/23  
261: wKe1, Sf1, Pa6; bKg1, Ba7 =/25  
262: wKe2, Sf1, Pa6; bKg2, Ba7 =/23  
263: wKe2, Sh5, Pa6; bKg2, Ba7 =/23

264: wKe5, Se4, Pa6; bKe3, Ba7 =/23  
265: wKe6, Sa5, Pa6; bKe4, Bc5 =/21  
266: wKe6, Sb7, Pa6; bKe8, Bb8 =/19  
267: wKf1, Sg1, Pa6; bKh1, Ba8 =/28  
268: wKf2, Sg1, Pa6; bKh2, Ba8 =/27  
269: wKf3, Sd3, Pa6; bKf1, Ba7 =/20  
270: wKf3, Sg2, Pa6; bKf1, Ba7 =/22  
271: wKf4, Sc1, Pa6; bKf2, Bg2 =/26  
272: wKf5, Se4, Pa6; bKf3, Ba7 =/25  
273: wKf6, Sa5, Pa6; bKf4, Bc5 =/22  
274: wKf6, Sb7, Pa6; bKf8, Bc8 =/15  
275: wKg3, Sc1, Pa6; bKf1, Bg2 =/27  
276: wKg3, Sg2, Pa6; bKg1, Ba7 =/23  
277: wKg3, Sh2, Pa6; bKg1, Ba8 =/27  
278: wKg5, Sb7, Pa6; bKg7, Bc8 =/17  
279: wKg6, Sa5, Pa6; bKg4, Bc5 =/23  
280: wKg6, Sb7, Pa6; bKg8, Bc8 =/16  
281: wKh3, Sg2, Pa6; bKh1, Ba7 =/24  
282: wKh3, Sh2, Pa6; bKh1, Ba8 =/29  
283: wKh5, Sb7, Pa6; bKh7, Bc8 =/18  
284: wKh5, Se6, Pa6; bKh7, Bc3 =/22  
285: wKh6, Sa5, Pa6; bKh4, Bc5 =/24  
286: wKh6, Sb7, Pa6; bKh8, Bc8 =/17  
287: wKa6, Sd7, Pb6; bKa4, Bh2 =/27  
288: wKa6, Se4, Pb6; bKa8, Be7 =/17  
289: wKa6, Sf7, Pb6; bKa8, Bf6 =/18  
290: wKa6, Sh7, Pb6; bKa8, Be7 =/17  
291: wKa6, Sa7, Pb6; bKb8, Bd7 =/19  
292: wKa7, Sa1, Pb6; bKa5, Ba6 =/20  
293: wKa7, Sa3, Pb6; bKa5, Ba6 =/15  
294: wKa7, Sb2, Pb6; bKa5, Ba6 =/15  
295: wKa7, Sc1, Pb6; bKa5, Ba6 =/20  
296: wKa7, Sc2, Pb6; bKa5, Bc8 =/19  
297: wKa7, Sc3, Pb6; bKa5, Ba6 =/15  
298: wKa7, Sc7, Pb6; bKa5, Bd8 =/17  
299: wKa7, Sd2, Pb6; bKa5, Ba6 =/15  
300: wKa7, Sd4, Pb6; bKa5, Ba6 =/13  
301: wKa7, Sd5, Pb6; bKa5, Bc8 =/15  
302: wKa7, Sd6, Pb6; bKa5, Ba6 =/12  
303: wKa7, Sd8, Pb6; bKa5, Ba6 =/15  
304: wKa7, Se1, Pb6; bKa5, Ba6 =/20  
305: wKa7, Se2, Pb6; bKa5, Bc8 =/19  
306: wKa7, Se3, Pb6; bKa5, Ba6 =/15  
307: wKa7, Se4, Pb6; bKa5, Bc8 =/14  
308: wKa7, Se5, Pb6; bKa5, Ba6 =/15  
309: wKa7, Se6, Pb6; bKa5, Bc8 =/19  
310: wKa7, Se7, Pb6; bKa5, Ba6 =/14  
311: wKa7, Se8, Pb6; bKa5, Bc8 =/14

312: wKa7, Sf2, Pb6; bKa5, Ba6 =/15  
313: wKa7, Sf3, Pb6; bKa5, Bc8 =/19  
314: wKa7, Sf4, Pb6; bKa5, Ba6 =/16  
315: wKa7, Sf5, Pb6; bKa5, Bc8 =/14  
316: wKa7, Sf6, Pb6; bKa5, Ba6 =/15  
317: wKa7, Sf7, Pb6; bKa5, Bc8 =/14  
318: wKa7, Sf8, Pb6; bKa5, Ba6 =/16  
319: wKa7, Sg1, Pb6; bKa5, Ba6 =/20  
320: wKa7, Sg3, Pb6; bKa5, Ba6 =/15  
321: wKa7, Sg5, Pb6; bKa5, Ba6 =/15  
322: wKa7, Sg6, Pb6; bKa5, Bc8 =/15  
323: wKa7, Sg7, Pb6; bKa5, Ba6 =/15  
324: wKa7, Sg8, Pb6; bKa5, Bc8 =/15  
325: wKa7, Sh2, Pb6; bKa5, Ba6 =/20  
326: wKa7, Sh4, Pb6; bKa5, Ba6 =/15  
327: wKa7, Sh6, Pb6; bKa5, Ba6 =/15  
328: wKa7, Sh8, Pb6; bKa5, Ba6 =/15  
329: wKa7, Sb3, Pb6; bKb5, Ba6 =/19  
330: wKa7, Sb7, Pb6; bKb5, Ba6 =/12  
331: wKa7, Sc2, Pb6; bKb5, Ba6 =/19  
332: wKa7, Sc4, Pb6; bKb5, Ba6 =/12  
333: wKa7, Sc6, Pb6; bKb5, Ba6 =/15  
334: wKa7, Se2, Pb6; bKb5, Ba6 =/19  
335: wKa7, Se4, Pb6; bKb5, Ba6 =/13  
336: wKa7, Sf3, Pb6; bKb5, Ba6 =/19  
337: wKa7, Sf5, Pb6; bKb5, Ba6 =/13  
338: wKa7, Sf7, Pb6; bKb5, Ba6 =/13  
339: wKa7, Sg6, Pb6; bKb5, Ba6 =/15  
340: wKa7, Sg8, Pb6; bKb5, Ba6 =/15  
341: wKa7, Sc5, Pb6; bKd8, Bc8 =/20  
342: wKa7, Sd3, Pb6; bKf6, Bc8 =/23  
343: wKb2, Se6, Pb6; bKd2, Bd6 =/27  
344: wKb3, Se6, Pb6; bKd3, Bd6 =/26  
345: wKb5, Sc5, Pb6; bKa3, Bc8 =/15  
346: wKb5, Sc5, Pb6; bKd6, Be7 =/23  
347: wKb5, Sc5, Pb6; bKe2, Bc8 =/18  
348: wKb7, Sd2, Pb6; bKa5, Bd3 =/21  
349: wKb7, Sg5, Pb6; bKd6, Bf5 =/18  
350: wKb8, Sb4, Pb6; bKd7, Bc8 =/17  
351: wKb8, Sc7, Pb6; bKd7, Bc8 =/21  
352: wKb8, Sb5, Pb6; bKg2, Be6 =/20  
353: wKc4, Sc5, Pb6; bKe3, Bc8 =/17  
354: wKc4, Sd7, Pb6; bKe4, Bf4 =/26  
355: wKc5, Sc4, Pb6; bKa4, Bb8 =/25  
356: wKc6, Sf8, Pb6; bKc8, Bb8 =/18  
357: wKc6, Sg6, Pb6; bKc8, Bg7 =/19  
358: wKc6, Sg2, Pb6; bKe4, Bb8 =/30  
359: wKc6, Sb5, Pb6; bKe5, Ba6 =/21  
360: wKc7, Sd4, Pb6; bKa5, Ba6 =/21  
361: wKc7, Sf5, Pb6; bKa5, Bc8 =/22  
362: wKc7, Sb4, Pb6; bKb5, Bc8 =/19  
363: wKc7, Sb8, Pb6; bKb5, Bc8 =/17  
364: wKc7, Sc6, Pb6; bKb5, Ba6 =/18  
365: wKc7, Sd7, Pb6; bKb5, Ba6 =/14  
366: wKc7, Se5, Pb6; bKb5, Bc8 =/17  
367: wKc7, Sf6, Pb6; bKb5, Bc8 =/15  
368: wKc7, Sf8, Pb6; bKb5, Bc8 =/17  
369: wKc7, Sc6, Pb6; bKc5, Bc8 =/18  
370: wKc7, Sb7, Pb6; bKd5, Bc6 =/20  
371: wKd3, Sc5, Pb6; bKf3, Bc8 =/17  
372: wKd4, Sc5, Pb6; bKf4, Bc8 =/16  
373: wKd4, Sd6, Pb6; bKf4, Ba6 =/19  
374: wKd5, Sd3, Pb6; bKe7, Ba3 =/24  
375: wKd5, Se5, Pb6; bKe7, Bd6 =/12  
376: wKd5, Sd7, Pb6; bKf5, Bf4 =/25  
377: wKd7, Se6, Pb6; bKd5, Bb8 =/18  
378: wKe5, Sc5, Pb6; bKe3, Bc8 =/14  
379: wKg6, Sc7, Pb6; bKg8, Bd8 =/14  
380: wKh5, Sc7, Pb6; bKh7, Bd8 =/16  
381: wKh6, Sc7, Pb6; bKh8, Bd8 =/15  
382: wKa8, Sa5, Pc6; bKb6, Ba7 =/11  
383: wKa8, Sb4, Pc6; bKb6, Ba7 =/11  
384: wKa8, Sd4, Pc6; bKb6, Ba7 =/16  
385: wKa8, Sd8, Pc6; bKb6, Ba7 =/13  
386: wKa8, Se5, Pc6; bKb6, Ba7 =/12  
387: wKa8, Se7, Pc6; bKb6, Ba7 =/12  
388: wKa8, Se7, Pc6; bKc7, Bb8 =/12  
389: wKb2, Sd7, Pc6; bKd2, Be8 =/19  
390: wKb4, Sc4, Pc6; bKa2, Ba6 =/21  
391: wKb4, Sc7, Pc6; bKb2, Bb3 =/21  
392: wKb5, Sd7, Pc6; bKb3, Bc8 =/17  
393: wKb6, Sc7, Pc6; bKa4, Bb8 =/13  
394: wKb6, Sd7, Pc6; bKa8, Ba6 =/18  
395: wKb6, Sf7, Pc6; bKa8, Bb4 =/14  
396: wKb6, Sf4, Pc6; bKc8, Bf1 =/16  
397: wKb6, Sf5, Pc6; bKc8, Bb4 =/13  
398: wKb6, Sf7, Pc6; bKc8, Bb4 =/13  
399: wKb6, Sg5, Pc6; bKd8, Bb4 =/14  
400: wKb6, Sh6, Pc6; bKd8, Bb4 =/14  
401: wKb6, Sh8, Pc6; bKd8, Bb4 =/14  
402: wKb6, Sd7, Pc6; bKf5, Bc8 =/24  
403: wKb7, Sc7, Pc6; bKa5, Bb8 =/12  
404: wKb7, Sd7, Pc6; bKb5, Bc8 =/15  
405: wKb7, Sc5, Pc6; bKc2, Ba5 =/16  
406: wKb7, Sd4, Pc6; bKc5, Bb6 =/12  
407: wKb7, Sd6, Pc6; bKd8, Ba5 =/14



408: wKb7, Sc5, Pc6; bKe3, Ba5 =/21  
 409: wKc3, Se3, Pc6; bKg3, Be6 =/26  
 410: wKc5, Sd7, Pc6; bKe3, Ba6 =/25  
 411: wKc5, Sg4, Pc6; bKe4, Bb3 =/25  
 412: wKc5, Sd5, Pc6; bKh6, Bd8 =/17  
 413: wKc7, Sa3, Pc6; bKa6, Ba7 =/18  
 414: wKc7, Sd7, Pc6; bKb5, Bc8 =/12  
 415: wKd2, Se3, Pc6; bKf2, Be6 =/27  
 416: wKd3, Se3, Pc6; bKf3, Be6 =/25  
 417: wKd4, Se3, Pc6; bKd2, Bh3 =/24  
 418: wKd4, Sg8, Pc6; bKe2, Ba6 =/27  
 419: wKd4, Sa4, Pc6; bKf4, Ba6 =/23  
 420: wKd4, Se3, Pc6; bKf4, Be6 =/24  
 421: wKd5, Sc3, Pc6; bKf4, Ba6 =/23  
 422: wKd5, Se4, Pc6; bKf4, Bc8 =/22  
 423: wKd5, Sf2, Pc6; bKf4, Ba6 =/23  
 424: wKd5, Sf6, Pc6; bKf4, Ba6 =/23  
 425: wKd5, Sa4, Pc6; bKf5, Ba6 =/20  
 426: wKd6, Sh6, Pc6; bKd8, Bh7 =/10  
 427: wKd6, Sd7, Pc6; bKf5, Bc8 =/22  
 428: wKd6, Sa4, Pc6; bKf6, Ba6 =/17  
 429: wKd6, Sb3, Pc6; bKf6, Ba6 =/17  
 430: wKd6, Sb7, Pc6; bKf6, Ba6 =/17  
 431: wKd6, Sc5, Pc6; bKf6, Bc8 =/16  
 432: wKd6, Se6, Pc6; bKf6, Ba6 =/17  
 433: wKd6, Sd4, Pc6; bKg5, Ba6 =/23  
 434: wKd7, Sc8, Pc6; bKa8, Bb8 =/12  
 435: wKd7, Sc4, Pc6; bKb8, Bc7 =/10  
 436: wKd7, Sc7, Pc6; bKe5, Bd8 =/13  
 437: wKd8, Se7, Pc6; bKb8, Ba6 =/15  
 438: wKh6, Sd7, Pc6; bKh8, Be8 =/14  
 439: wKc2, Se7, Pd6; bKe2, Bf8 =/16  
 440: wKc4, Sc6, Pd6; bKa3, Bb6 =/15  
 441: wKc4, Sb4, Pd6; bKb2, Bb6 =/17  
 442: wKc6, Se7, Pd6; bKa6, Bf8 =/14  
 443: wKc6, Sa6, Pd6; bKc8, Ba5 =/13  
 444: wKc6, Se6, Pd6; bKc8, Ba5 =/ 8  
 445: wKc6, Sf5, Pd6; bKc8, Bf2 =/14  
 446: wKc6, Sg4, Pd6; bKc8, Bg7 =/14  
 447: wKc6, Sc7, Pd6; bKd8, Ba5 =/13  
 448: wKc6, Sg7, Pd6; bKd8, Ba5 =/13  
 449: wKc6, Sf5, Pd6; bKe8, Bg1 =/14  
 450: wKc7, Sb4, Pd6; bKa7, Be8 =/12  
 451: wKc7, Sb8, Pd6; bKa7, Be8 =/12  
 452: wKc7, Sa2, Pd6; bKa8, Be8 =/13  
 453: wKc7, Sa6, Pd6; bKa8, Be8 =/13  
 454: wKc7, Sc2, Pd6; bKa8, Be8 =/13  
 455: wKc7, Sc3, Pd6; bKa8, Bb5 =/14  
 456: wKc7, Sc6, Pd6; bKa8, Be8 =/11  
 457: wKc7, Sc8, Pd6; bKa8, Be8 =/13  
 458: wKc7, Sd3, Pd6; bKa8, Be8 =/13  
 459: wKc7, Sd5, Pd6; bKa8, Be8 =/13  
 460: wKc7, Sd7, Pd6; bKa8, Be8 =/13  
 461: wKc7, Sd7, Pd6; bKb5, Bc8 =/12  
 462: wKc7, Se4, Pd6; bKd5, Bc8 =/13  
 463: wKd3, Sb4, Pd6; bKc1, Bb6 =/19  
 464: wKd5, Sd4, Pd6; bKa3, Bb6 =/17  
 465: wKe5, Sd7, Pd6; bKb5, Bg6 =/15  
 466: wKe6, Sc7, Pd6; bKg6, Bb8 =/14  
 467: wKe7, Sd7, Pd6; bKf5, Be8 =/13  
 468: wKf7, Sf8, Pd6; bKh8, Bc8 =/10  
 469: wKg6, Sf6, Pd6; bKf8, Bh8 =/11  
 470: wKa1, Sa4, Pa5; bKc1, Bd6 =/24  
 471: wKa2, Sa4, Pa5; bKc2, Bd6 =/23  
 472: wKa6, Se5, Pa5; bKc5, Ba3 =/19  
 473: wKa6, Se7, Pa5; bKc7, Bb8 =/17  
 474: wKa8, Sb6, Pa5; bKc7, Bb8 =/15  
 475: wKa8, Sd6, Pa5; bKc7, Bb8 =/13  
 476: wKa8, Se7, Pa5; bKc7, Bb8 =/13  
 477: wKb3, Sc2, Pa5; bKd3, Bb8 =/24  
 478: wKb4, Sb3, Pa5; bKd3, Bc4 =/21  
 479: wKb4, Sb8, Pa5; bKd3, Bc4 =/26  
 480: wKb6, Sg1, Pa5; bKc3, Bc8 =/27  
 481: wKb6, Sh2, Pa5; bKc3, Bc8 =/26  
 482: wKb6, Sb1, Pa5; bKd4, Bc8 =/28  
 483: wKb6, Sf2, Pa5; bKd4, Bc8 =/27  
 484: wKb6, Sf4, Pa5; bKd4, Bc8 =/27  
 485: wKb6, Se1, Pa5; bKe4, Bc8 =/27  
 486: wKc3, Sc5, Pa5; bKe3, Bc8 =/30  
 487: wKc4, Sb4, Pa5; bKb2, Bb7 =/27  
 488: wKc6, Sf4, Pa5; bKc4, Bc8 =/29  
 489: wKc6, Sd5, Pa5; bKd4, Bc8 =/30  
 490: wKd1, Sh3, Pa5; bKf1, Bc3 =/26  
 491: wKd3, Sc4, Pa5; bKd1, Ba6 =/30  
 492: wKd3, Se5, Pa5; bKd1, Bc8 =/31  
 493: wKd4, Sb4, Pa5; bKd2, Be2 =/31  
 494: wKd4, Se3, Pa5; bKd2, Ba6 =/32  
 495: wKd6, Sb6, Pa5; bKd8, Ba7 =/16  
 496: wKd6, Sd5, Pa5; bKe4, Bc8 =/33  
 497: wKe2, Sh5, Pa5; bKg2, Bg1 =/22  
 498: wKe4, Se3, Pa5; bKe2, Ba6 =/34  
 499: wKe6, Se5, Pa5; bKe4, Ba7 =/21  
 500: wKf1, Sb3, Pa5; bKh2, Bg1 =/24  
 501: wKg3, Sd2, Pa5; bKg1, Ba6 =/35  
 502: wKg3, Se3, Pa5; bKg1, Bb7 =/35  
 503: wKg3, Sf4, Pa5; bKg1, Bc4 =/38

504: wKh3, Se3, Pa5; bKh1, Bb7 =/36  
505: wKh3, Sf4, Pa5; bKh1, Bc4 =/39  
506: wKa4, Se5, Pb5; bKc5, Ba3 =/18  
507: wKa6, Sb6, Pb5; bKb4, Ba5 =/12  
508: wKa6, Sb6, Pb5; bKb8, Ba7 =/14  
509: wKa7, Sf7, Pb5; bKc7, Bc8 =/16  
510: wKa8, Sa3, Pb5; bKb6, Ba7 =/13  
511: wKa8, Sc3, Pb5; bKb6, Ba7 =/13  
512: wKa8, Sc7, Pb5; bKb6, Ba7 =/13  
513: wKa8, Sd4, Pb5; bKb6, Ba7 =/13  
514: wKa8, Sd6, Pb5; bKb6, Ba7 =/13  
515: wKa8, Sa7, Pb5; bKc7, Bb8 =/13  
516: wKb6, Sb7, Pb5; bKd7, Bc8 =/17  
517: wKb6, Sf7, Pb5; bKd7, Bc8 =/17  
518: wKb6, Sd4, Pb5; bKg4, Bb8 =/27  
519: wKb6, Sf3, Pb5; bKh3, Bb8 =/31  
520: wKb7, Sd5, Pb5; bKf1, Ba5 =/25  
521: wKb8, Sb7, Pb5; bKd7, Bc8 =/14  
522: wKb8, Se4, Pb5; bKd7, Bc8 =/21  
523: wKb8, Sf7, Pb5; bKd7, Bc8 =/13  
524: wKb8, Sg5, Pb5; bKd8, Bc8 =/20  
525: wKc6, Sb6, Pb5; bKb8, Ba7 =/14  
526: wKc6, Sc5, Pb5; bKc5, Bd8 =/23  
527: wKc6, Sd6, Pb5; bKf8, Bd8 =/19  
528: wKc7, Sc5, Pb5; bKa7, Bc8 =/9  
529: wKc7, Sc2, Pb5; bKf2, Ba8 =/20  
530: wKd4, Sc5, Pb5; bKf5, Bc8 =/19  
531: wKd6, Sc4, Pb5; bKf5, Ba8 =/19  
532: wKf5, Sg5, Pb5; bKh6, Bg2 =/23  
533: wKb8, Sb7, Pc5; bKd7, Bc8 =/12  
534: wKc6, Sc7, Pc5; bKa7, Bb8 =/12  
535: wKc6, Sb5, Pc5; bKa8, Bb8 =/18  
536: wKc6, Sb6, Pc5; bKb8, Ba7 =/14  
537: wKc6, Sc7, Pc5; bKe7, Bd8 =/16  
538: wKc8, Sa3, Pc5; bKa7, Bb8 =/17  
539: wKc8, Sc3, Pc5; bKa7, Bb8 =/17  
540: wKc8, Sc7, Pc5; bKa7, Bb8 =/12  
541: wKc8, Sd6, Pc5; bKa7, Bb8 =/15  
542: wKc8, Sd5, Pc5; bKa8, Bb8 =/18  
543: wKc8, Se6, Pc5; bKa8, Bb8 =/18  
544: wKc8, Se8, Pc5; bKa8, Bb8 =/14  
545: wKc8, Sc7, Pc5; bKe7, Bd8 =/13  
546: wKd7, Sd8, Pc5; bKa8, Ba5 =/18  
547: wKd7, Sa3, Pc5; bKb8, Bc7 =/14  
548: wKd7, Sd6, Pc5; bKb8, Bc7 =/13  
549: wKd7, Sd4, Pc5; bKf2, Bg1 =/22  
550: wKd7, Sd1, Pc5; bKh3, Be1 =/21  
551: wKg7, Sf6, Pc5; bKf5, Bg6 =/20

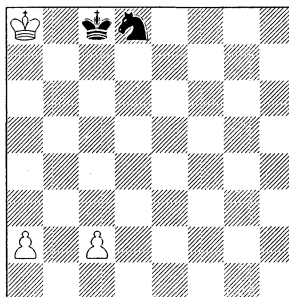
552: wKh8, Sf4, Pc5; bKf7, Bg8 =/16  
553: wKa3, Se3, Pd5; bKb5, Ba4 =/18  
554: wKa6, Sb6, Pd5; bKb4, Ba5 =/14  
555: wKa8, Sb4, Pd5; bKb6, Ba7 =/15  
556: wKa8, Se7, Pd5; bKc7, Bb8 =/15  
557: wKc8, Sc7, Pd5; bKe7, Bd8 =/12  
558: wKd8, Sd7, Pd5; bKb7, Bc8 =/13  
559: wKd8, Sd7, Pd5; bKf7, Be8 =/13  
560: wKe8, Se7, Pd5; bKc7, Bd8 =/12  
561: wKf3, Sf4, Pd5; bKh4, Bg3 =/15  
562: wKg6, Sf6, Pd5; bKf8, Bg7 =/15  
563: wKh8, Se6, Pd5; bKf7, Bg8 =/17  
564: wKa8, Sc4, Pa4; bKc7, Bb8 =/17  
565: wKb3, Sb2, Pa4; bKd2, Bc3 =/22  
566: wKb7, Sb8, Pa4; bKd8, Bc7 =/22  
567: wKc8, Sc4, Pa4; bKe8, Bd8 =/25  
568: wKd3, Sc4, Pa4; bKc1, Ba6 =/31  
569: wKd3, Sb3, Pa4; bKd1, Be1 =/27  
570: wKd4, Sb4, Pa4; bKd2, Bf1 =/32  
571: wKd4, Se3, Pa4; bKd2, Be2 =/33  
572: wKf2, Sg4, Pa4; bKh1, Bb7 =/40  
573: wKf3, Sf2, Pa4; bKf1, Ba6 =/37  
574: wKg3, Sd2, Pa4; bKg1, Bb7 =/38  
575: wKg3, Sd2, Pa4; bKg1, Bd3 =/36  
576: wKh3, Sd2, Pa4; bKh1, Bb7 =/39  
577: wKa1, Sc2, Pb4; bKb3, Ba2 =/16  
578: wKa3, Se3, Pb4; bKb5, Ba4 =/16  
579: wKa3, Se4, Pb4; bKc4, Ba2 =/23  
580: wKa5, Sb5, Pb4; bKb3, Ba4 =/15  
581: wKa5, Sb5, Pb4; bKb7, Ba6 =/19  
582: wKa5, Se4, Pb4; bKc4, Ba6 =/15  
583: wKa8, Se7, Pb4; bKc7, Bb8 =/16  
584: wKb5, Sc5, Pb4; bKc3, Ba1 =/22  
585: wKb7, Se5, Pb4; bKd6, Bc7 =/18  
586: wKa5, Sb5, Pc4; bKb7, Ba6 =/17  
587: wKa8, Sa4, Pc4; bKc7, Bb8 =/19  
588: wKa8, Sf5, Pc4; bKc7, Bb8 =/18  
589: wKa8, Sg6, Pc4; bKc7, Bb8 =/17  
590: wKb3, Se1, Pc4; bKc5, Ba3 =/17  
591: wKf6, Sd5, Pc4; bKh6, Bg8 =/24  
592: wKf6, Sd5, Pc4; bKh8, Bg8 =/24  
593: wKh5, Sg5, Pc4; bKg7, Bh6 =/19  
594: wKa5, Sb5, Pd4; bKb3, Ba4 =/16  
595: wKa5, Sb5, Pd4; bKb7, Ba6 =/17  
596: wKa8, Sc5, Pd4; bKb6, Ba7 =/18  
597: wKh1, Sf2, Pd4; bKg3, Bh2 =/18  
598: wKh5, Sg5, Pd4; bKg3, Bh4 =/17  
599: wKh5, Sg5, Pd4; bKg7, Bh6 =/18

600: wKa8, Sb4, Pa3; bKb6, Ba7 =/20  
601: wKb2, Sc3, Pa3; bKc4, Bb3 =/19  
602: wKc8, Sc4, Pa3; bKe7, Bd8 =/26  
603: wKh8, Sh4, Pa3; bKf7, Bg8 =/25  
604: wKa2, Se3, Pb3; bKc3, Ba1 =/25  
605: wKa4, Sb4, Pb3; bKb2, Ba3 =/17  
606: wKa4, Sb4, Pb3; bKb6, Ba5 =/21  
607: wKa8, Sf5, Pb3; bKc7, Bb8 =/18  
608: wKh4, Sg4, Pb3; bKg6, Bh5 =/26  
609: wKa1, Se2, Pc3; bKc2, Bb1 =/20  
610: wKa4, Sb4, Pc3; bKb6, Ba5 =/20  
611: wKa8, Sb4, Pc3; bKb6, Ba7 =/22  
612: wKb2, Sc2, Pc3; bKc4, Ba2 =/19  
613: wKh4, Sg4, Pc3; bKg6, Bh5 =/23  
614: wKa1, Se1, Pd3; bKb3, Ba2 =/20  
615: wKa4, Sb4, Pd3; bKb2, Ba3 =/18  
616: wKa4, Sb4, Pd3; bKb6, Ba5 =/21  
617: wKh1, Sd1, Pd3; bKg3, Bh2 =/21  
618: wKh4, Sg4, Pd3; bKg2, Bh3 =/20  
619: wKh4, Sg4, Pd3; bKg6, Bh5 =/22  
620: wKa1, Sd1, Pa2; bKc1, Ba3 1/=   
621: wKa8, Se7, Pa2; bKc7, Bb8 =/18  
622: wKb1, Sc2, Pa2; bKc3, Bb2 =/21  
623: wKb5, Sd3, Pa2; bKg3, Ba3 =/24  
624: wKc1, Sc5, Pa2; bKe2, Bd1 =/22  
625: wKe3, Sd3, Pa2; bKd1, Bc2 =/23  
626: wKe3, Sc3, Pa2; bKe1, Bc2 =/32  
627: wKa1, Sa5, Pb2; bKc2, Bb1 =/27  
628: wKa1, Sc5, Pb2; bKc2, Bb1 =/27  
629: wKa3, Sb3, Pb2; bKb1, Ba2 =/17  
630: wKc3, Sb3, Pb2; bKb1, Ba2 =/14  
631: wKh3, Sg3, Pb2; bKg5, Bh4 =/28  
632: wKa3, Sb3, Pc2; bKb5, Ba4 =/22  
633: wKa8, Se7, Pc2; bKc7, Bb8 =/18  
634: wKb1, Sb6, Pc2; bKc3, Ba1 =/26  
635: wKb1, Sc1, Pc2; bKc3, Ba1 =/21  
636: wKc3, Sb3, Pc2; bKb1, Ba2 =/13  
637: wKh1, Sg5, Pc2; bKg3, Bh2 =/26  
638: wKh3, Sg3, Pc2; bKg5, Bh4 =/25  
639: wKa1, Se3, Pd2; bKb3, Ba2 =/20  
640: wKa3, Sb3, Pd2; bKb5, Ba4 =/23  
641: wKh1, Sg5, Pd2; bKg3, Bh2 =/25  
642: wKh3, Sg3, Pd2; bKg5, Bh4 =/24

## AJR's SNIPPETS

1. We learn from the March 1999 issue of the International Computer Chess Association Journal that Ken Thompson of *BELLE* and oracle database fame has been awarded the National Medal of Technology, the U.S. commerce department's highest honour for achievement in technology. Among his other achievements are his work with Dennis Ritchie (with whom he shares the award) in developing the Unix operating system and the computer language C. All readers will echo our congratulations.
2. \*C\* The position below, which we take from the same journal, was discovered by Bruce Morland (Seattle, USA) in his computer research. For some reason it is given with Black having the knight.

\*C\*



a8c8 0003.20 d8.a2c2 3/2 mate in 17.

Here is one line, in which there are numerous duals: 1...Sc6 2.a3 Kc7 3.a4 Kb6 4.a5+ Kc7 5.a6 Se5 6.c3 Sc4 7.Ka7 Sb6 8.c4 Sd7 9.Ka8 Kb6 10.c5+ Kc6 11.Ka7 Kc7 12.Ka8 Se5 13.Ka7 Sc6+ 14.Ka8 Kc8 15.a7 Se5 16.c6 Sc4 17.c7 Sb6 mate.

## GBR code

(after Guy/Blandford/Roycroft) concisely denotes chessboard force in at most 6 digits. Examples: two white knights and one black pawn codes into **0002.01**; wQ bQ wR codes as **4100**; wBB vs bN codes as **0023**; the full complement of 32 chessmen codes as **4888.88**. The key to encoding is to compute the sum '1-for-W-and-3-for-BI' for each piece type in QRBN sequence, with white pawns and black pawns uncoded following the 'decimal point'. The key for decoding is to divide each QRBN digit by 3, when the quotient and remainder are in each of the 4 cases the numbers of BI and W pieces respectively.

The GBR code permits unique sequencing, which, together with the fact that a computer sort of several thousand codes and the reference attached to each is a matter of a second or two, enormously facilitates the construction of look-up directories.

A consequence of the foregoing is the code's greatest overall advantage: its user-friendliness. The GBR code has the unique characteristic of equally suiting humans and computers. No special skill or translation process is required whether the code is encountered on a computer printout or whether it is to be created (for any purpose, including input to a computer) from a chess diagram.

A natural extension of the GBR code is to use it to represent a complete position. A good convention is to precede the GBR code with the squares of the kings, and follow the code with the squares of the pieces, in W-before-BI within code digit sequence, preserving the 'decimal point' to separate the pieces from the pawns, if any (where all W pawns precede all BI). The 223-move optimal play solution position in the endgame wR wB bN bN would be represented: a7d3 **0116.00** b2b3c6d6 3/3+. The '3/3' is a control

indicating 3 W and 3 BI men, with '+' meaning W wins, while '=' would mean White draws. The win/draw indicators are optional. Note that although in this example there are no pawns the GBR code decimal point and immediately following pair of zeroes are obligatory (enabling a scan of a text file searching for encoded chess positions) but the absence of a decimal point in the list of squares confirms that there are no pawns. A position with pawns but no pieces would be coded in this manner: a2c4 **0000.32** .d4e3f2e4f3 4/3 WTM. To indicate Black to move (but still with the implied win or draw for White) it is suggested that '-+' and '-=' be employed. Where the position result is unknown or undecided or unknowable it is suggested that the computer chess convention 'WTM' (White to move) and 'BTM' be followed. The redundancy check piece-count (including the '/' separator) and terminating full stop are both obligatory.