

TRUE Zn	Correction for 1 Minute of Time																		TRUE Zn
	Latitude in Degrees																		
	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	
090	+15.0	+14.9	+14.8	+14.5	+14.1	+13.6	+13.0	+12.3	+11.5	+10.6	+9.6	+8.6	+7.5	+6.3	+5.1	+3.9	+2.6	+1.3	090
092	15.0	14.9	14.8	14.5	14.1	13.6	13.0	12.3	11.5	10.6	9.6	8.6	7.5	6.3	5.1	3.9	2.6	1.3	088
094	15.0	14.9	14.7	14.5	14.1	13.6	13.0	12.3	11.5	10.6	9.6	8.6	7.5	6.3	5.1	3.9	2.6	1.3	086
096	14.9	14.9	14.7	14.4	14.0	13.5	12.9	12.2	11.4	10.5	9.6	8.6	7.5	6.3	5.1	3.9	2.6	1.3	084
098	14.9	14.8	14.6	14.3	14.0	13.5	12.9	12.2	11.4	10.5	9.5	8.5	7.4	6.3	5.1	3.8	2.6	1.3	082
100	+14.8	+14.7	+14.5	+14.3	+13.9	+13.4	+12.8	+12.1	+11.3	+10.4	+9.5	+8.5	+7.4	+6.2	+5.1	+3.8	+2.6	+1.3	080
102	14.7	14.6	14.4	14.2	13.8	13.3	12.7	12.0	11.2	10.4	9.4	8.4	7.3	6.2	5.0	3.8	2.5	1.3	078
104	14.6	14.5	14.3	14.1	13.7	13.2	12.6	11.9	11.1	10.3	9.4	8.3	7.3	6.2	5.0	3.8	2.5	1.3	076
106	14.4	14.4	14.2	13.9	13.5	13.1	12.5	11.8	11.0	10.2	9.3	8.3	7.2	6.1	4.9	3.7	2.5	1.3	074
108	14.3	14.2	14.0	13.8	13.4	12.9	12.4	11.7	10.9	10.1	9.2	8.2	7.1	6.0	4.9	3.7	2.5	1.2	072
110	+14.1	+14.0	+13.9	+13.6	+13.2	+12.8	+12.2	+11.5	+10.8	+10.0	+9.1	+8.1	+7.0	+6.0	+4.8	+3.6	+2.4	+1.2	070
112	13.9	13.9	13.7	13.4	13.1	12.6	12.0	11.4	10.7	9.8	8.9	8.0	7.0	5.9	4.8	3.6	2.4	1.2	068
114	13.7	13.7	13.5	13.2	12.9	12.4	11.9	11.2	10.5	9.7	8.8	7.9	6.9	5.8	4.7	3.5	2.4	1.2	066
116	13.5	13.4	13.3	13.0	12.7	12.2	11.7	11.0	10.3	9.5	8.7	7.7	6.7	5.7	4.6	3.5	2.3	1.2	064
118	13.2	13.2	13.0	12.8	12.4	12.0	11.5	10.8	10.1	9.4	8.5	7.6	6.6	5.6	4.5	3.4	2.3	1.2	062
120	+13.0	+12.9	+12.8	+12.5	+12.2	+11.8	+11.3	+10.6	+10.0	+9.2	+8.4	+7.5	+6.5	+5.5	+4.4	+3.4	+2.3	+1.1	060
122	12.7	12.7	12.5	12.3	12.0	11.5	11.0	10.4	9.7	9.0	8.2	7.3	6.4	5.4	4.4	3.3	2.2	1.1	058
124	12.4	12.4	12.2	12.0	11.7	11.3	10.8	10.2	9.5	8.8	8.0	7.1	6.2	5.3	4.3	3.2	2.2	1.1	056
126	12.1	12.1	12.0	11.7	11.4	11.0	10.5	9.9	9.3	8.6	7.8	7.0	6.1	5.1	4.2	3.1	2.1	1.1	054
128	11.8	11.8	11.6	11.4	11.1	10.7	10.2	9.7	9.1	8.4	7.6	6.8	5.9	5.0	4.0	3.1	2.1	1.0	052
130	+11.5	+11.4	+11.3	+11.1	+10.8	+10.4	+10.0	+9.4	+8.8	+8.1	+7.4	+6.6	+5.7	+4.9	+3.9	+3.0	+2.0	+1.0	050
132	11.1	11.1	11.0	10.8	10.5	10.1	9.7	9.1	8.5	7.9	7.2	6.4	5.6	4.7	3.8	2.9	1.9	1.0	048
134	10.8	10.8	10.6	10.4	10.1	9.8	9.3	8.8	8.3	7.6	6.9	6.2	5.4	4.6	3.7	2.8	1.9	0.9	046
136	10.4	10.4	10.3	10.1	9.8	9.4	9.0	8.5	8.0	7.4	6.7	6.0	5.2	4.4	3.6	2.7	1.8	0.9	044
138	10.0	10.0	9.9	9.7	9.4	9.1	8.7	8.2	7.7	7.1	6.5	5.8	5.0	4.2	3.4	2.6	1.7	0.9	042
140	+9.6	+9.6	+9.5	+9.3	+9.1	+8.7	+8.4	+7.9	+7.4	+6.8	+6.2	+5.5	+4.8	+4.1	+3.3	+2.5	+1.7	+0.8	040
142	9.2	9.2	9.1	8.9	8.7	8.4	8.0	7.6	7.1	6.5	5.9	5.3	4.6	3.9	3.2	2.4	1.6	0.8	038
144	8.8	8.8	8.7	8.5	8.3	8.0	7.6	7.2	6.8	6.2	5.7	5.1	4.4	3.7	3.0	2.3	1.5	0.8	036
146	8.4	8.4	8.3	8.1	7.9	7.6	7.3	6.9	6.4	5.9	5.4	4.8	4.2	3.5	2.9	2.2	1.5	0.7	034
148	7.9	7.9	7.8	7.7	7.5	7.2	6.9	6.5	6.1	5.6	5.1	4.6	4.0	3.4	2.7	2.1	1.4	0.7	032
150	+7.5	+7.5	+7.4	+7.2	+7.0	+6.8	+6.5	+6.1	+5.7	+5.3	+4.8	+4.3	+3.8	+3.2	+2.6	+1.9	+1.3	+0.7	030
152	7.0	7.0	6.9	6.8	6.6	6.4	6.1	5.8	5.4	5.0	4.5	4.0	3.5	3.0	2.4	1.8	1.2	0.6	028
154	6.6	6.6	6.5	6.4	6.2	6.0	5.7	5.4	5.0	4.6	4.2	3.8	3.3	2.8	2.2	1.7	1.1	0.6	026
156	6.1	6.1	6.0	5.9	5.7	5.5	5.3	5.0	4.7	4.3	3.9	3.5	3.1	2.6	2.1	1.6	1.1	0.5	024
158	5.6	5.6	5.5	5.4	5.3	5.1	4.9	4.6	4.3	4.0	3.6	3.2	2.8	2.4	1.9	1.5	1.0	0.5	022
160	+5.1	+5.1	+5.1	+5.0	+4.8	+4.6	+4.4	+4.2	+3.9	+3.6	+3.3	+2.9	+2.6	+2.2	+1.8	+1.3	+0.9	+0.4	020
162	4.6	4.6	4.6	4.5	4.4	4.2	4.0	3.8	3.6	3.3	3.0	2.7	2.3	2.0	1.6	1.2	0.8	0.4	018
164	4.1	4.1	4.1	4.0	3.9	3.7	3.6	3.4	3.2	2.9	2.7	2.4	2.1	1.7	1.4	1.1	0.7	0.4	016
166	3.6	3.6	3.6	3.5	3.4	3.3	3.1	3.0	2.8	2.6	2.3	2.1	1.8	1.5	1.2	0.9	0.6	0.3	014
168	3.1	3.1	3.1	3.0	2.9	2.8	2.7	2.6	2.4	2.2	2.0	1.8	1.6	1.3	1.1	0.8	0.5	0.3	012
170	+2.6	+2.6	+2.6	+2.5	+2.4	+2.4	+2.3	+2.1	+2.0	+1.8	+1.7	+1.5	+1.3	+1.1	+0.9	+0.7	+0.5	+0.2	010
172	2.1	2.1	2.1	2.0	2.0	1.9	1.8	1.7	1.6	1.5	1.3	1.2	1.1	0.9	0.7	0.5	0.4	0.2	008
174	1.6	1.6	1.5	1.5	1.5	1.4	1.4	1.3	1.2	1.1	1.0	0.9	0.8	0.7	0.5	0.4	0.3	0.1	006
176	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.9	0.8	0.7	0.7	0.6	0.5	0.4	0.4	0.3	0.2	0.1	004
178	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.3	0.3	0.3	0.2	0.2	0.1	0.1	0.0	002
180	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	000
182	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.4	-0.4	-0.4	-0.3	-0.3	-0.3	-0.2	-0.2	-0.1	-0.1	-0.0	358
184	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.9	0.8	0.7	0.7	0.6	0.5	0.4	0.4	0.3	0.2	0.1	356
186	1.6	1.6	1.5	1.5	1.5	1.4	1.4	1.3	1.2	1.1	1.0	0.9	0.8	0.7	0.5	0.4	0.3	0.1	354
188	2.1	2.1	2.1	2.0	2.0	1.9	1.8	1.7	1.6	1.5	1.3	1.2	1.0	0.9	0.7	0.5	0.4	0.2	352
190	2.6	2.6	2.6	2.5	2.4	2.4	2.3	2.1	2.0	1.8	1.7	1.5	1.3	1.1	0.9	0.7	0.5	0.2	350
192	-3.1	-3.1	-3.1	-3.0	-2.9	-2.8	-2.7	-2.6	-2.4	-2.2	-2.0	-1.8	-1.6	-1.3	-1.1	-0.8	-0.5	-0.3	348
194	3.6	3.6	3.6	3.5	3.4	3.3	3.1	3.0	2.8	2.6	2.3	2.1	1.8	1.5	1.2	0.9	0.6	0.3	346
196	4.1	4.1	4.1	4.0	3.9	3.7	3.6	3.4	3.2	2.9	2.7	2.4	2.1	1.7	1.4	1.1	0.7	0.4	344
198	4.6	4.6	4.6	4.5	4.4	4.2	4.0	3.8	3.6	3.3	3.0	2.7	2.3	2.0	1.6	1.2	0.8	0.4	342
200	5.1	5.1	5.1	5.0	4.8	4.6	4.4	4.2	3.9	3.6	3.3	2.9	2.6	2.2	1.8	1.3	0.9	0.4	340
202	-5.6	-5.6	-5.5	-5.4	-5.3	-5.1	-4.9	-4.6	-4.3	-4.0	-3.6	-3.2	-2.8	-2.4	-1.9	-1.5	-1.0	-0.5	338
204	6.1	6.1	6.0	5.9	5.7	5.5	5.3	5.0	4.7	4.3	3.9	3.5	3.1	2.6	2.1	1.6	1.1	0.5	336
206	6.6	6.6	6.5	6.4	6.2	6.0	5.7	5.4	5.0	4.6	4.2	3.8	3.3	2.8	2.2	1.7	1.1	0.6	334
208	7.0	7.0	6.9	6.8	6.6	6.4	6.1	5.8	5.4	5.0	4.5	4.0	3.5	3.0	2.4	1.8	1.2	0.6	332
210	7.5	7.5	7.4	7.2	7.0	6.8	6.5	6.1	5.7	5.3	4.8	4.3	3.8	3.2	2.6	1.9	1.3	0.7	330
212	-7.9	-7.9	-7.8	-7.7	-7.5	-7.2	-6.9	-6.5	-6.1	-5.6	-5.1	-4.6	-4.0	-3.4	-2.7	-2.1	-1.4	-0.7	328
214	8.4	8.4	8.3	8.1	7.9	7.6	7.3	6.9	6.4	5.9	5.4	4.8	4.2	3.5	2.9	2.2	1.5	0.7	326
216	8.8	8.8	8.7	8.5	8.3	8.0	7.6	7.2	6.8	6.2	5.7	5.1	4.4	3.7	3.0	2.3	1.5	0.8	324
218	9.2	9.2	9.1	8.9	8.7	8.4	8.0	7.6	7.1	6.5	5.9	5.3	4.6	3.9	3.2	2.4	1.6	0.8	322
220	9.6	9.6	9.5	9.3	9.1	8.7	8.4	7.9	7.4	6.8	6.2	5.5	4.8	4.1	3.3	2.5	1.7	0.8	320
222	-10.0	-10.0	-9.9	-9.7	-9.4	-9.1	-8.7	-8.2	-7.7	-7.1	-6.5	-5.8	-5.0	-4.2	-3.4	-2.6	-1.7	-0.9	318
224	10.4	10.4	10.3	10.1	9.8	9.4	9.0	8.5	8.0	7.4	6.7	6.0	5.2	4.4	3.6	2.7	1.8	0.9	316
226	10.8	10.8	10.6	10.4	10.1	9.8	9.3	8.8	8.3	7.6	6.9	6.2	5.4	4.6	3.7	2.8	1.9	0.9	314
228	11.1	11.1	11.0	10.8	10.5	10.1	9.7	9.1	8.5	7.9	7.2	6.4	5.6	4.7	3.8	2.9	1.9	1.0	312
230	11.5	11.4	11.3	11.1	10.8	10.4	10.0	9.4	8.8	8.1	7.4	6.6	5.7	4.9	3.9	3.0	2.0	1.0	310
232	-11.8	-11.8	-11.6	-11.4	-11.1	-10.7	-10.2	-9.7	-9.1	-8									