

## C Factor Procedures, Curvature/Refraction

**PURPOSE:** Use this graphic training aid (GTA) when performing the “C” Check. See Field Manual (FM) 3-34.331 for more information.

### Field Procedure for “C” Check

1. In a relatively flat area, set the turning pins approximately 100 meters apart.
2. Instrument setup #1:
  - a. Set the level up 10 meters ( $\pm 1$  meter) from rod 1 (Figure 1) and in line with rod 2.
  - b. Take the three-wire reading on the near rod (rod 1).
  - c. Take the three-wire reading on the far rod (rod 2).
3. Instrument setup #2:
  - a. Set the level up 10 meters ( $\pm 1$  meter) from rod 2 (Figure 2) and in line with rod 1.
  - b. Take the three-wire reading on the near rod (rod 2).
  - c. Take the three-wire reading on the far rod (rod 1).
4. Find the correction for both foresight readings on the Correction for Curvature and Refraction Leveling table. Apply the sum of the corrections to the total foresight mean. (The correction sum is always negative [-]).

Compute “C” factor:

$$C = \frac{(\text{Sum of near center-wire readings}) - (\text{Sum of far center-wire readings})}{(\text{Sum of far rod intervals}) - (\text{Sum of near rod intervals})}$$

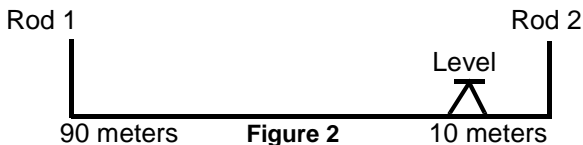
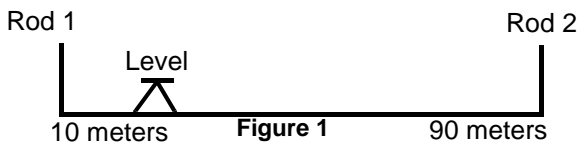
## Headquarters, Department of the Army

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## Correction for Curvature and Refraction (Leveling)

Distance in meters	Correction to rod in meters	Distance in meters	Correction to rod in meters
0 to 27	0.0000	160	-0.0017
28 to 47	-0.0001	170	-0.0020
48 to 60	-0.0002	180	-0.0022
61 to 71	-0.0003	190	-0.0024
72 to 81	-0.0004	200	-0.0027
82 to 90	-0.0005	210	-0.0030
91 to 98	-0.0006	220	-0.0033
99 to 105	-0.0007	230	-0.0036
106 to 112	-0.0008	240	-0.0039
113 to 118	-0.0009	250	-0.0042
119 to 124	-0.0010	260	-0.0046
125 to 130	-0.0011	270	-0.0049
131 to 135	-0.0012	280	-0.0053
136 to 141	-0.0013	290	-0.0057
142 to 146	-0.0014	300	-0.0061
147 to 150	-0.0015		

To convert degrees Fahrenheit ( $^{\circ}F$ ) to degrees centigrade ( $^{\circ}C$ ) use the following formula:  $^{\circ}C = \frac{5}{9} (^{\circ}F - 32)$  (or go to Table A-2 of FM 3-34.331)

To convert altitude to millimeters of mercury (mm Hg), use the following formula:  $mm\ Hg = 760 \frac{(87.783 + 0.00198h)}{87.783} 5.256$

h = altitude in meters

To convert inches of mercury (in Hg) to millimeters of mercury (mm Hg), use the following formula:

$$mm\ Hg = in\ Hg \times 25.4$$