
LONG DISTANCE MESSAGE TELECOMMUNICATIONS SERVICE**A. Method of Applying Rates**

1. Determination of Rate Centers

Station-to-Station and Person-to-Person Long Distance Message Telecommunications Service rates are based upon the time of day that the call is made. Long Distance Telecommunications Conference Service rates between points (cities, towns, or localities) are based on the air line distance between rate centers. In general, each point is designated as a rate center; certain small towns or localities are assigned adjacent rate centers with which they are closely associated for communications purposes or by community of interest.

2. Vertical and Horizontal Coordinates

For the purpose of determining air line mileages vertical and horizontal grid lines have been established across the United States and Canada. The spacing between adjacent vertical grid lines and between horizontal grid lines represents a distance of one coordinate unit. This unit is the square root of 0.1, expressed in statute miles. A vertical (V) and a horizontal (H) coordinate is computed for each rate center from its latitude and longitude location by use of appropriate map-projection equations. A pair of V & H coordinates locates a rate center, for determining air line mileages, at a particular intersection of an established vertical grid line with an established horizontal grid line. The distance between any two rate centers is the air line mileage computed as explained in 3, following, with fractional miles being considered full miles.

3. Determination of Air Line Mileages

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To determine the rate distance between any two rate centers, proceed as follows:

1. Obtain the "V" and "H" coordinates for each rate center.
2. Obtain the difference between the "V" coordinates of the two rate centers. Obtain the difference between the "H" coordinates.

Note: The difference is always obtained by subtracting the smaller coordinate from the larger coordinate.

3. Divide each of the differences obtained in 2. by three, rounding each quotient to the nearer integer.
4. Square these two integers and add the two squares.

If the sum of the squares is greater than 1777, divide the integers obtained in 3. by three and repeat step 4. Repeat this process until the sum of the squares obtained in 4. is less than 1778.

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A. Method of Applying Rates (cont'd)

3. Determination of Air Line Mileages(cont'd)

a. Long Distance Telecommunications Service (cont'd)

5. The number of successive divisions by three in steps 3. and 4. determines the value of "N". Multiply the final sum of the two squares obtained in step 4. by the multiplier specified in the following table for this value of "N" preceding:

<u>N</u>	<u>Multiplier</u>	<u>Minimum Rate Mileage</u>
1	0.9	--
2	8.1	41
3	72.9	121
4	656.1	361
5	5,904.9	1,081
6	53,144.1	3,241

6. Obtain square root of product in 5. and, with any resulting fraction, round up to next higher integer. This is the message rate mileage except that when the mileage so obtained is less than the minimum rate mileage shown in 5., preceding, the minimum rate mileage corresponding to the "N" value is applicable.

EX: The message rate distance is required between Abilene, Kansas, and Topeka, Kansas.

	<u>V</u>	<u>H</u>
a. Abilene	7235	4599
Topeka	<u>7110</u>	<u>4369</u>

- b. Difference 125 230
- c. Dividing each difference by three and rounding to nearer integer = 42 and 77

- d. Squaring integers and adding, 42 x 42 = 1764
77 x 77 = 5929
 Sum of squared integers 7693
 Sum of squared integers is greater than 1777, so divide integers in c. by three and repeat d.

- e. Dividing integers in c. by three and rounding = 14 and 26

- f. Squaring integers and adding, 14 x 14 = 196
26 x 26 = 676
 Sum of squared integers 872
 This sum of squared integers is less than 1778 and was obtained after two successive divisions by three; therefore, "N" = 2.

- g. Multiply final sum of squared integers 872
 by factor 8.1 (corresponding to "N" = 2) x 8.1
7063.2

- h. Square root of 7063.2 = 84 and a fraction, which is rounded up to 85 miles (fractional miles being considered full miles). The 85 miles is larger than the minimum of 41 rate miles applicable when "N" = 2, so the message rate mileage is 85 miles.