METHOD OF APPLYING RATES

A. General

1. LDMTS 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 adjacent rate centers with which they are closely associated for communication purposes or by community of interest.

2. For the purpose of determining airline 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 airline 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 airline mileage computed as explained in paragraph A.3 following, with fractional miles being considered full miles.

3. Determination of Air Line Mileages

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

   a. Obtain the "V" and "H" coordinates for each rate center.

   b. 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.

   c. Divide each of the differences obtained in b. by three, rounding each quotient to the nearer integer.

   d. Square these two integers and add the two squares.

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

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

N	Multiplier	Minimum Rate Mileage
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

METHOD OF APPLYING RATES (cont'd)

A. General (cont'd)

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

f. Obtain square root of product in e. 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 e., preceding, the minimum rate mileage corresponding to the "N" value is applicable.

Example:

Airline Mileage between Dallas, Texas and Paris, Texas

Rate Center	V	H
a. Dallas	8436	4034
Paris	8173	3897
b. Difference	263	137

c1. Dividing each difference by three and rounding to nearer integer = 88 and 46

d1. Squaring integers and adding, 88 x 88 = 7,744
46 x 46 = 2,116

Sum of squared integers 9,860

Sum of squared integers is greater than 1777, so divide integers in c1. by three and repeat d1.

c2. Dividing integers in c1. by three and rounding = 29 and 15

d2. Squaring integers and adding, 29 x 29 = 841
15 x 15 = 225

Sum of squared integers 1,066

This sum of squared integers is less than 1778 and was obtained after two successive divisions by three; therefore, "N" = 2.

e. Multiply final sum of squared integers 1,066
by factor 8.1 (corresponding to "N" = 2) x 8.1

= 8,634.6

f. Square root of 8,634.6 = 92 and a fraction, which is rounded up to 93 miles (fractional miles being considered full miles). The 93 miles is larger than the minimum of 41 rate miles applicable when "N" = 2, so the message rate mileage is 93 miles.