ITEM 100	**General**	
	1. Each exchange and each toll telephone is designated as a Rate Centre. 2. "Rate Centre" means the point in each exchange from which distances are measured for the calculation of charges for interexchange services, Extended Area Service (EAS)* and for computing rates for Message Toll Calls. (* EAS is equivalent to Extended Flat Rate Calling (EFRC) for Centrex Service/Systems.) 3. The Vertical-Horizontal method of measuring airline distances is a system whereby the geographic co-ordinates for each Rate Centre are translated into numerical "Vertical" and "Horizontal" (V & H) geometric co-ordinates which permit the mathematical computation of the air mileage between any two Rate Centres. 4. The V & H system consists of a series of co-ordinates which represent a theoretical grid of vertical and horizontal lines covering Alberta. The spacing between adjacent parallel lines is about 1670 feet and represents a distance of one co-ordinate unit. 5. A vertical and horizontal co-ordinate is computed for each Rate Centre from its latitude and longitude location by use of appropriate map-projection equations. A pair of V & H co-ordinates locates a Rate Centre, for determining airline distances, at the intersection of the vertical and horizontal grid lines so designated; it also designates the centre of a square having each side about 1670 feet long and an area of about one-tenth of a square mile. The rate distance between any two Rate Centres is the airline distance between the points designated by the V & H co-ordinates of the respective Rate Centres.	C | |

ITEM 100.1	**Method of Computing V & H Message Toll Rate Distance**	
	(a) Obtain the "V" and "H" co-ordinates for each center. (b) Obtain the difference between the "V" co-ordinates and the difference between the "H" co-ordinates, in each case by subtracting the smaller co-ordinate from the larger. (c) Divide each of such differences by three, rounding each quotient to the nearest whole number. (d) Square the 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.	

ITEM 100.1 **Method of Computing V & H Message Toll Rate Distance - Continued**

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

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

(f) Obtain the square root of the product in (e) and, with any resulting fraction, round to the next highest whole number. This is the rate distance, except that when the distance so obtained is less than the minimum rate distance shown in (e), the minimum rate distance corresponding to the value of "N" applies.

(g) Example of determination of message toll rate distance:

1. The rate distance is required between Edmonton and Lethbridge. The co-ordinates of these two Rate Centres are as follows:

	"V"	"H"
Edmonton	4887	7824
Lethbridge	5696	7592
2. Co-ordinate Difference	809	232

3. (a) Divide each difference by three and round to the nearest whole number = 270 and 77.

Square integers and add:

270 x 270 = 72,900
77 x 77 = 5,929
Sum of squared integers 78,829

Sum of square integers is greater than 1777, therefore divide integers above and repeat process.

ITEM 100.1	**Method of Computing V & H Message Toll Rate Distance - Continued**	
	b) Divide integers in (a) by three and round to the nearest whole number = 90 and 26. Square integers and add: 90 x 90 = 8,100 26 x 26 = 676 Sum of squared integers 8,776 Sum of squared integers is greater than 1777, therefore divide integers above and repeat process. (c) Divide integers in (b) by three and round to the nearest whole number = 30 and 9. Square integers and add: 30 x 30 = 900 9 x 9 = 81 Sum of squared integers 981 This sum of squared integers is less than 1778, and was obtained after three successive divisions by three; therefore "N" = 3. 4. Multiply final sum of squared integers by factor 72.9 (corresponding to "N" = 3) 981 x 72.9 = 71,514.9 5. Square root of 71,514.9 = 267 and a fraction which is rounded to 268 miles (a fraction of a mile being considered a full mile). The 268 miles is larger than the minimum of 121 rate miles applicable when "N" = 3; consequently the rate distance is 268 miles.	

ITEM 100.2	**Method of Computing Interexchange Rate Distance**	
	1. The interexchange rate distance is computed by using the Vertical (V) and Horizonal (H) Coordinates of the Rate Centres. Such distance is the square root of one tenth (1/10) of the sum of the square of the difference between the V Coordinate and the square of the difference of the H Coordinate, with any remaining fraction being rounded to the next higher mile. The formula is as follows: $\text{Rate Distance} = \sqrt{.1(V_1 - V_2)^2 + (H_1 - H_2)^2}$ where V_1 is the larger of the V coordinates and H_1 is the larger of the H coordinates.	